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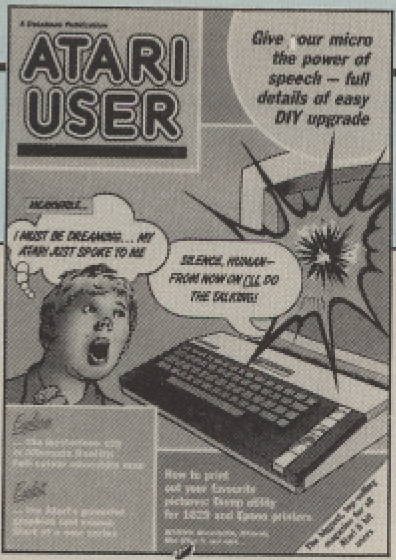
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Contents

Arcade prices lopped

ATARI 8 bit games producer STV Software has slashed prices on its current and future arcade-style programs

Recently released Joe & the Nuclear Caverns will now cost £7.99 on disc and £3.99 on cassette instead of £10.99 and £7.99.

The same new prices will apply to Darg – due out late July – and Pothole Panic (featuring Joe) which is due for release in the autumn.

"After talking to distributors handling our products we have decided to go for quantity sales instead of holding up prices", said Peter O'Carroll, managing director of STV Software (021-770 1003).

"A look at the latest charts shows that budget games are among the biggest sellers today and we have to compete with them".

This month's new release, Darg, features an alien who crashlands on earth and must locate and dig for the special crystals he needs to refuel his space ship.

Pothole Panic will be a follow-up to Joe & the Nuclear Caverns with Joe lost underground and having to dynamite his way to the surface.

Micros in action

THE thriving Shropshire Atari User Group took its message on to the streets in June to show people its micros in action.

An estimated 200,000 visitors to Telford Town Centre saw demonstrations of Atari hardware and software during the six-day exhibition.

It is the latest community venture by the group which has won praise for the way it provides computing advice and assistance to local voluntary organisations.

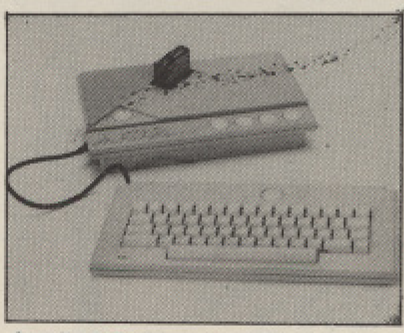
Atari geared up for games market boon

THERE is going to be a dramatic upsurge in the games machine market this year, and Atari is determined to be ready for it.

It is no accident the company brought out the XE computer games system to complement its 130XE and redesigned 20 million-selling 2600VCS.

"We expect a major revival in the video console sector during the last quarter of 1987 if not before", a company spokesman told *Atari User*.

"We believe the average age of prospective buyers is getting younger because the big market for sub-£100 hardware was not catered for properly in 1985 or 1986.



Atari's XE games system

"This means there are a lot of under 10s out there who aren't really ready for a proper micro but are keen to get their hands on a games machine.

"And it doesn't hurt Atari's prospects that we already have a games software range that is second to none".

Atari originally estimated it would sell 150,000 8 bit computers and games consoles in 1987. But this figure had to be hurredly revised when advance orders for 70,000 units were placed in the first few weeks of the year.

The company began talking about selling at least 200,000 – and possibly a quarter of a million – games machines in 1987.

And, with orders for VCS machines currently standing at 90,000 units, even this figure looks like being exceeded before the beginning of next year.

Competition is hotting up

ATARI faces some stiff competition in what is expected to be a bonanza market for games machines this year, particularly at Christmas.

The company's new consoles will come up against opposition from Nintendo and Sega.

Mastertronic has just signed a deal for the UK distribution rights to the Sega Games Console and claims: "This is a very important project for us – consoles are going to be very big sellers this Christmas".

But Atari would appear to have the edge over the competition.

The Ninentendo Entertainment System – marketed in the UK and Europe by Mattel – costs £130 and the Sega Games Console £99 compared to the Atari XE at £89.95.

And while the Sega machine will be launched with only 12 games cartridges and the Nintendo with about 27, Jack Tramiel has already promised the XE will be backed by more than 400 pieces of software.

In addition, Atari has the lead in persuading High Street stores to stock its new product.

Dixons, Currys and Woolworths are virtually certain to give shelf space to the XE, and W H Smith another probable outlet.

Serious attraction

MINI OFFICE II is well on its way to becoming the biggest selling serious software package ever produced for the Atari 8-bit range.

Launched at the Atari Computer Show in London in April, the product was an instant hit with the thousands of visitors who flocked to the Novotel.

Several standholders stocked the package and they were impressed by its enthusiastic reception and bumper sales.

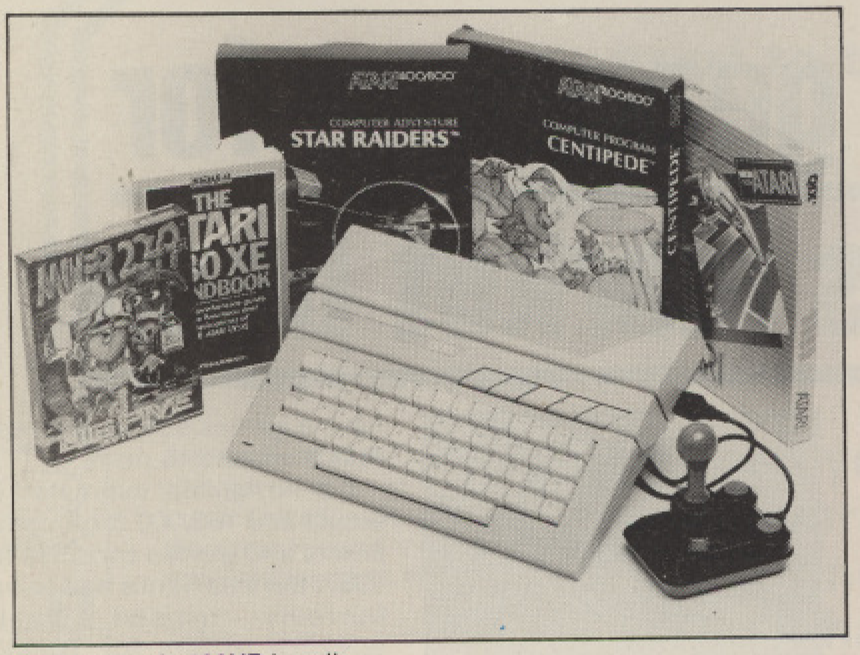
The £19.95 disc – with its word processor, spreadsheet, database, graphics, comms and label printing modules – is continuing to dominate its sector of the market.

Mike Jones of leading distributor Software Express told *Atari User*: "Mini Office II is a fantastic product, which is why it is selling very well in all parts of the country – I even had an order for 10 from Ireland the other day". And



John Hambly of Silica Distribution said: "There is nothing to compare with Mini Office II in the Atari 8 bit market. The nearest competition is American and twice the price".

News



Compumart's 130XE bundle

Shortages hit 8 bit sales

BRITAIN'S biggest Atari 8 bit dealer Compumart says it is being driven out of the 130XE market because the price of the machine has increased and supplies of vital peripherals have dried up.

Compumart managing director Steve Burke told *Atari User:* "In one fell swoop Atari has pushed the recommended retail price of the 130XE from £99 to nearly £130 and at the same time stopped providing disc drives and printers.

"We are losing between £5,000 and £7,000 a week in lost sales because the 1050 disc drive and 1027 and 1029 printers are not available.

"These peripherals are essential to our 130XE sales strategy and we are trying desperately to find alternative replacements at prices our customers can afford – but without much luck".

To combat the Atari price increase Compumart is currently bundling the 130XE with four arcade games cartridges, Microblaster joystick with micro switches and Atari 130XE handbook for £125 – £5 less than the official RRP for the machine alone.

"This adds up to a saving of over £60", said Steve Burke. "We have about 50 Atari 130XEs to bundle, and after they are sold we are not going to carry on selling the machine on its own for – £130 it just isn't worth our while".

Atari UK spokesman Peter Walker defended the company's decision to increase the price of the 130XE. "When the present management took over it inherited practices it didn't like", he told *Atari User.*

"For instance, a word processing bundle including the 130XE, 1050 printer and 1029 printer with software was being sold at cost.

"The management has discontinued this box-shifting exercise and because of new confidence in the product is now charging what the market expects.

"Steve Burke has got it wrong about supplies of disc drives and printers. We have adequate stocks of 1050 drives and 1027 and 1029 printers in the UK to last until the end of this year, based on current demand.

"In September we are launching a replacement for the single 1050 disc drive – the XSD551 double sided drive.

"And later on we will bring out the XMM801 dot matrix printer as a replacement for current printer models.

"In the last quarter of this year we'll also be selling a 'sports bag pack' of 130XE and games software – but we are not doing any more bundling".

THE GALLUP CHART TOP 20 ATARI SOFTWARE

THIS MONTH	LAST MONTH	TITLE (Software House)	PRICE
1	•	GAUNTLET *US Gold*	9.95
2	•	ATTACK OF THE MUTANT CAMELS *Mastertronic*	1.99
3	•	MICRO RHYTHM *Firebird*	1.99
4	•	DEATH RACE *Atlantis*	2.99
5	2	COLONY *Bulldog*	1.99
6	•	FRENESIS *Mastertronic*	1.99
7	•	GRIDRUNNER *Mastertronic*	1.99
8	18	ARKANOID *Imagine*	8.95
9	11	GUN LAW *Mastertronic*	1.99
10	1	BMX SIMULATOR *Code Masters*	1.99
11	7	LEADERBOARD *Access/US Gold*	9.95
12	6	FOUR GREAT GAMES *Micro Value*	3.99
13	•	STRATOSPHERE *Players*	1.99
14	3	SILENT SERVICE *Microprose/US Gold*	9.95
15	16	WARHAWK *Firebird*	1.99
16	10	LA SWAT *Mastertronic*	2.99
17	12	NINJA *Mastertronic*	1.99
18	•	MINI OFFICE II *Database*	19.95
19	5	GREEN BERET *Imagine*	8.95
20	17	CRYSTAL RAIDER *Mastertronic*	1.99

Compiled by Gallup/Microscope

Gauntlet enters the chart this month at number one, while Microrhythm from Firebird and Mini Office II from Database offer non-games packages for your Atari – reviews of both are in this month's issue.

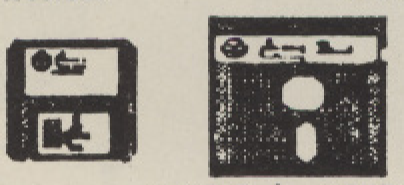
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130XE Computer	£119.00
Disk Drive	TBA
XC12 Recorder	£32.00



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HELPDos
from W.H. Ferguson

IT is not long after an Atari user has obtained a disc drive that he discovers he is using a command called Dos almost as much as he uses the PRINT command. Consequently, I have written this program to allow Dos to be called at a single keystroke.

It uses a Vertical Blank Interrupt (VBI) to enable the Help key to call the Dos menu from disc (or Ramdisc). A second VBI allows you to alter the background colour when Dos is displayed, which is normally restricted to the default value colour of Graphics 0.

Pressing the reset button disables VBIs so the program also traps this key, meaning that the VBI is reinitialised every time it is pressed.

The background colour is set to the value in location 1675 allowing you to alter the colour of the display more permanently than by just poking a different value into location 710. The background colour for the Dos menu is stored in location 1727.

This program is best used with the 130XE and Dos 2.5 since the Ramdisc installed with the Dos menu allows instant access when Help is pressed. If you do not have a 130XE make sure that you have a MEM.SAV setup when you boot the system otherwise you could lose your file by inadvertently pressing Help. Without MEM.SAV the file will not be in memory on return to Basic.

```
10 FOR A=0 TO 69:READ D:POKE 1664+A,D:
NEXT A:POKE 1675,51:POKE 1727,114:REM
1675=BACKGROUND,1727=BACKGROUND(DOS)
20 DATA 169,151,141,36,2,169,6,141,37,
2,169,148,141,198,2,169,0,141,220,2,76
,64,21,169
30 DATA 172,133,10,169,6,133,11,173,22
0,2,201,0,240,3,76,172,6,76,138,194,16
9,190,141,36
40 DATA 2,169,6,141,37,2,169,0,141,254
,2,76,159,23,169,148,141,198,2,76,138,
194
50 POKE 12,128:POKE 13,6:? CHR$(125):P
OSITION 8,11:? "Press RESET to setup V
BI"
```

Get it right!

LINE CHSUM	LINE CHSUM	LINE CHSUM
10 20399 40 11584	20 12667 50 15147	30 12848

ORGAN
from L. Golding

TURN your Atari into an electronic organ in just five lines of Basic? Well, not quite. You only get one voice, there aren't any black notes and the sound comes in glorious monophone – but it will certainly repay five minutes typing time. Here is how it works.

Whenever you press a key, its internal code number (which is not the same as its Atascii value) is stored at location 764. The program translates these keycodes into numbers which generate specific musical pitches when used in a sound statement.

Another address (753) indicates when the key is released, and this is used to turn the sound off by reducing the volume to 0. The 14 top row keys play a scale from B to A, which is a pretty useful range.

The tricky bit is converting keycodes into their respective pitch values, especially since the codes don't follow any logical sequence. It could be done by 14 IF....THEN statements, such as: IF KEYCODE=31 THEN PITCH=60, but this would slow everything down far too much.

It would allow you to play the Dead March convincingly but if you wanted something jazzy it would not be possible to get the speed.

Our solution is to store the pitch values in array(A) which can be indexed directly by keycodes, like this:

PITCH=A(KEYCODE)

Line 10 sets up the array, reads the pitch values from line 20, inserts them all in the right places and disables Break. Line 30 just makes the screen a bit prettier and line 40 handles the keycodes.

Address 753 contains a value of 3 if any key is being held down or a 0 if all keys are released. Address 764 contains the keycode of the last key pressed, so by using both of the values held in the locations together you can see which key is being used and for how long.

As it happens the top row keycodes are all between 1 and 32. These are used to point to individual elements in the array and so retrieve the correct pitch values.

The IF...THEN statement at the end of this line disables most of the remaining keys, and the zero elements in the array take care of any that slip through the net.

Line 50 generates the sound using a Boolean expression to control volume. The value of (K>0) will be 1 if K is truly greater than zero, or 0 otherwise. And K, you will remember can be 3 or 0. So the expression K*3-(K>0) evaluates to 8 if the key is pressed or 0 when it's released and this is precisely what we need to switch the volume on or off in the sound statement.

There are no sharps or flats available so you will need to get semitones in the right places for different tunes. Even so the instrument will cope with most nursery rhymes, a wide range of hymns and carols and a fair selection of popular songs.

```
10 GRAPHICS 2+16:DIM N(32):FOR X=0 TO
32:READ D:N(X)=D:NEXT X:POKE 16,112:PO
KE 53774,112
20 DATA 0,91,0,96,72,128,81,108,121,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,53,0,47,
64,35,60,45,40
30 POSITION 5,2:? #6;"electronic":POSI
TION 7,4:? #6;"organ":POSITION 2,10:?
#6;"USE TOP ROW KEYS"
40 K=PEEK(753):P=PEEK(764)-23:IF P>32
OR P<0 THEN P=0
50 SOUND 0,N(P),10,K*3-(K>0):GOTO 40
```

Get it right!

LINE CHSUM	LINE CHSUM	LINE CHSUM
10 15504 40 9125	20 12847 50 5970	30 19704

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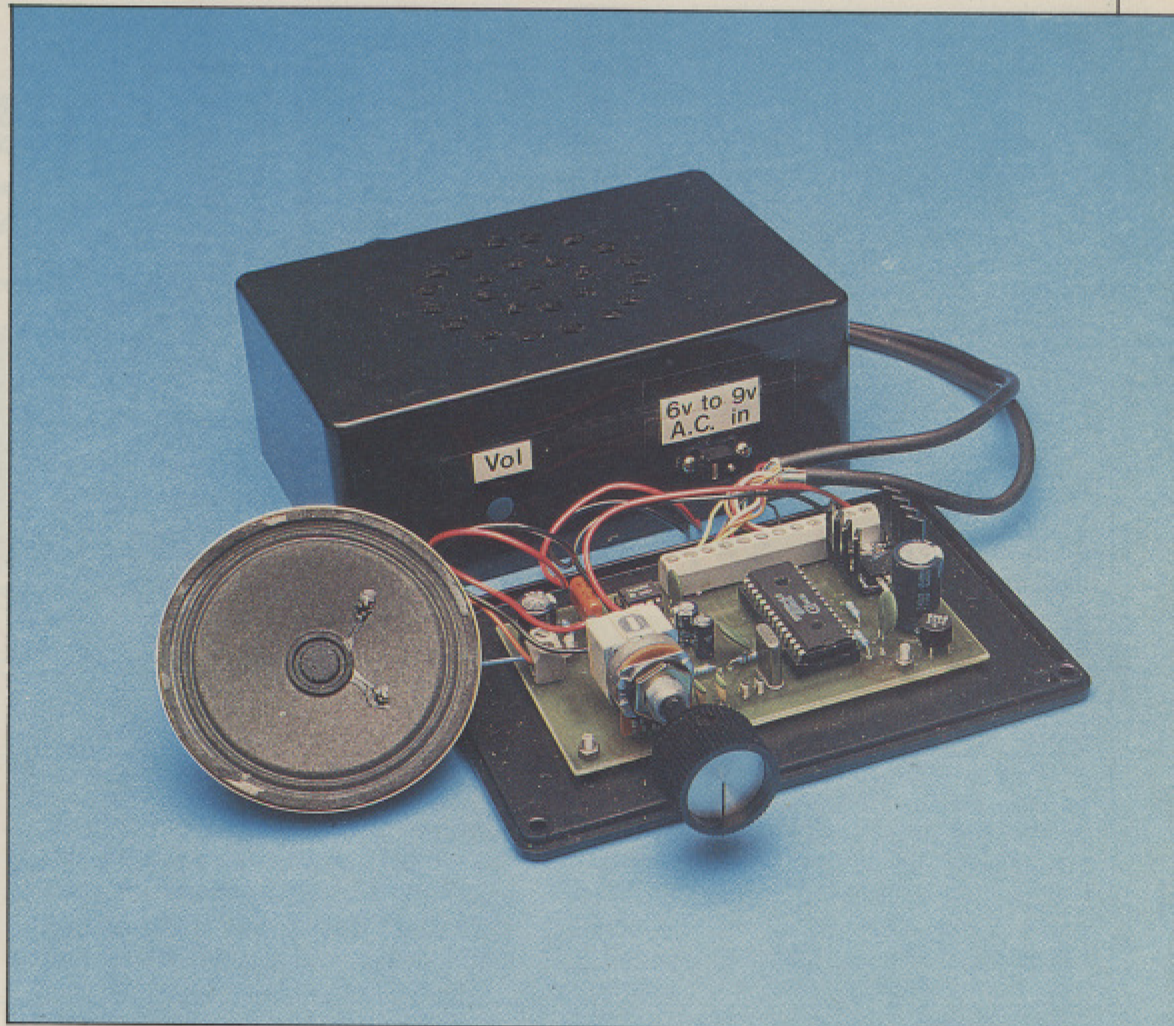
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Make your micro talk



LEN GOLDING makes the hardware for a speech synthesiser

WE described a gadget that responds to your voice in the March 1987 issue of *Atari User*. Now here's one that gives your Atari the power to talk back.

It's relatively inexpensive, straightforward to construct and easy to program. You can use it as a signalling device for visually handicapped people, an educational aid for students with reading difficulties or in any situation where visual or text output is inappropriate.

It also has great novelty value. How about an adventure game with talking monsters or a speak and spell program for young children?

Now we'll describe how to build and test it and next month we'll cover its operation in detail, showing how you can easily add speech output to your own Basic programs.

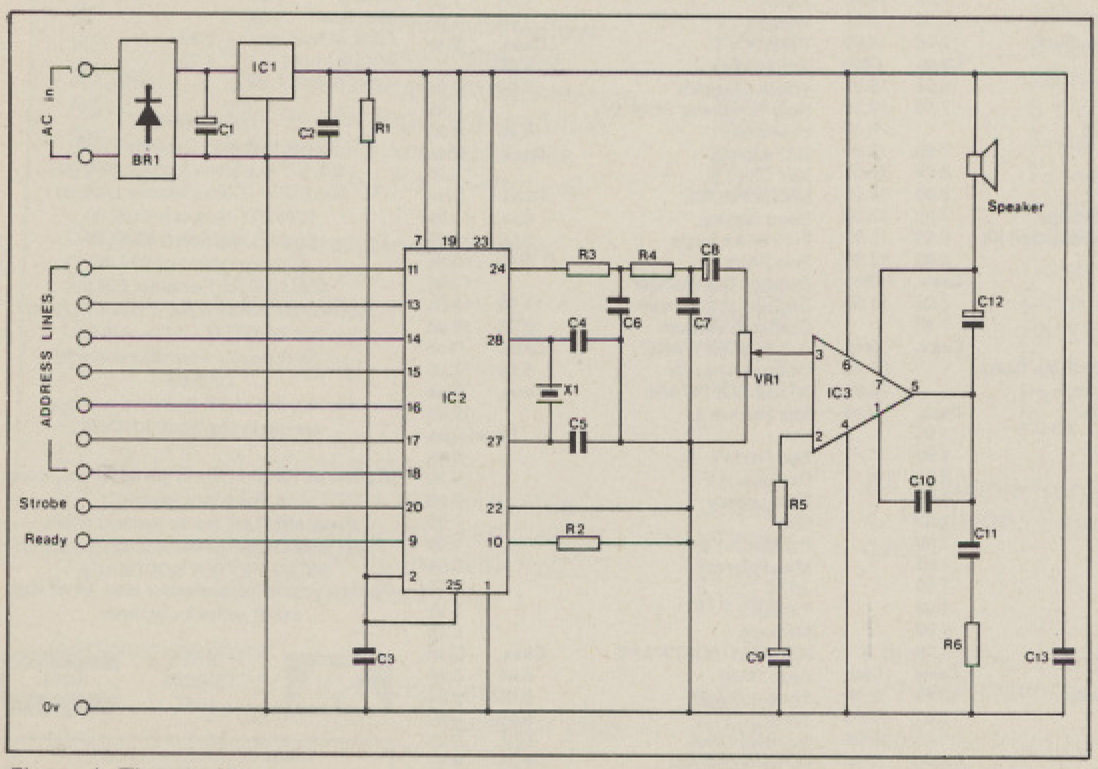


Figure I: The circuit

Figure I shows the circuit. Because the gadget draws over 100 milliamps at full output it cannot be powered directly from the joystick ports so some external supply is needed. BR1, IC1, C1 and C2 are included so that you can use any AC source around 6v to 9v, provided it can deliver at least 150 milliamps.

The transformers supplied with disc drives, 850 interfaces and 410 program recorders will work satisfactorily, and for this reason we've suggested using a power socket which will accept the plugs fitted as standard to those transformers.

Don't use the power pack which supplies your computer itself as there could be a danger of overload. In any case, the PSU supplied with XL/XE machines won't work with this gadget, since it delivers 5v DC. A 6v or 8v bell transformer such as Maplin FL37S works well, and has the advantage of being fully shrouded to reduce the risk of mains shocks. You can of course, buy a transformer for mounting permanently in the case - Maplin type YN14Q is suitable. Current drain is around 35mA even when the unit is not speaking, so battery operation is not práctical.

IC2 is the voice chip and it can produce 64 different speech sounds called allophones which, when

Turn to Page 12 ▶

combined correctly, can generate any word in the English language. Each allophone has its own code number from 0 to 63. To use the device set one of these numbers on the address lines in binary form, wait for pin 9 to go low then send a negative pulse to pin 20.

The chip does all the hard work and outputs a digital signal at pin 24. A low-pass filter (R3, R4, C6, C7) converts this into an audio signal which is then amplified by IC3 and appears as the chosen speech sound at the speaker.

The PCB foil pattern is shown in Figure II and, as always, an etched and drilled PCB is available from RH Design who, incidentally, can also supply ready-built versions of this and all other gadgets in the series.

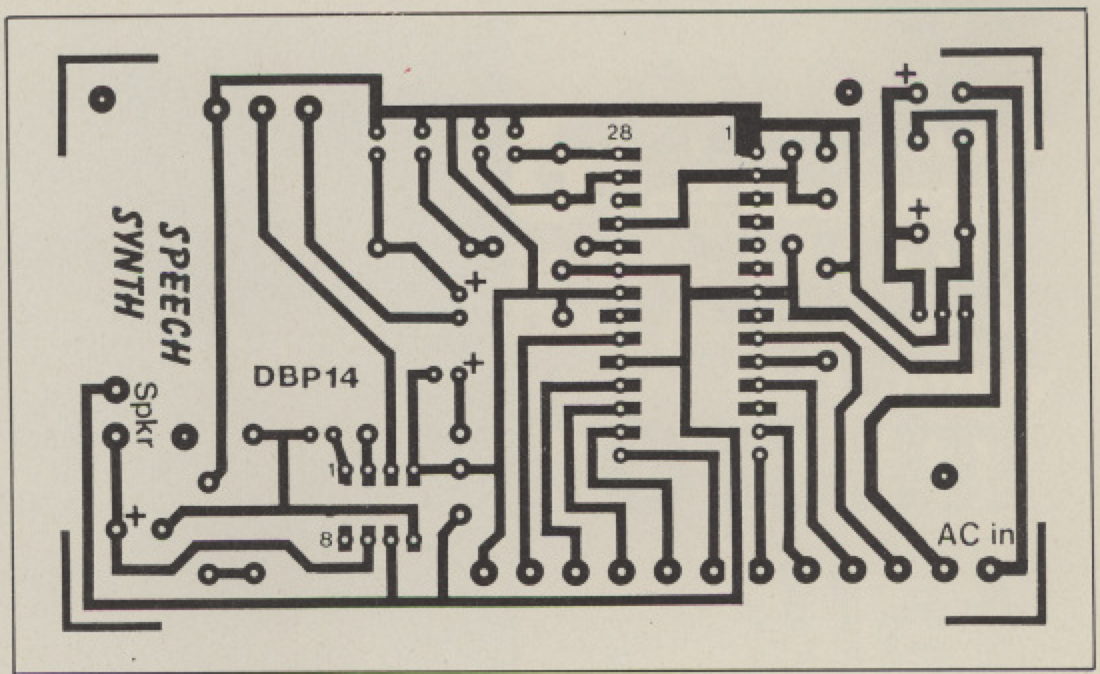


Figure II: The PCB (full size)

Figure III shows the component layout. Note the polarities for BR1, C1, C8, C9 and C12. BR1 has + marked while the electrolytic capacitors all carry a grey band with chevrons and 0 to indicate the negative side. All other capacitors and resistors can be fitted either way round.

Bend the leads of IC1 and bolt it into place along with its heat sink before soldering the leads. Make sure that IC2 and IC3 are fitted the right way round (IC3 is upside down) and that all pins sit correctly into their intended sockets.

The screw terminal blocks make assembly and testing easy but you can omit them if you don't mind soldering leads directly to the PCB tracks. The low-voltage AC supply is wired to the PCB connecting block through a switch controlled by VR1. You could use a cheaper unswitched pot if you are prepared to unplug the transformer whenever the unit is not in use.

When assembly is complete, inspect the board carefully to see that all

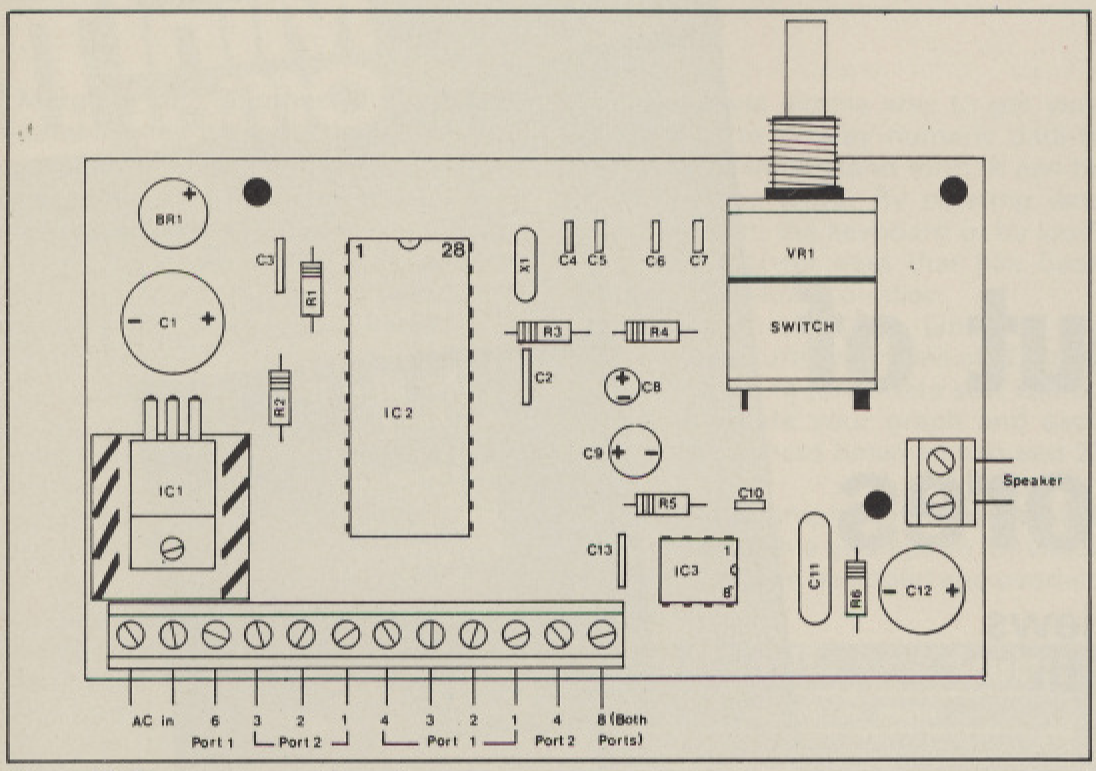


Figure III: The component layout

```
10 A=32:REM code number for allophone to be tested (can be 0 to 63)
20 POKE 54018,56:POKE 54016,255:POKE 54018,60:POKE 54016,0:REM set up ports for output
30 POKE 54016,A+128:REM send code with strobe high
40 IF PEEK(644)=1 THEN 40:REM wait for "ready" signal
50 POKE 54016,A:POKE 54016,A+128:REM pulse strobe line low, then high again
60 FOR W=1 TO 50:NEXT W:REM short delay to avoid sharp sound cutoff
70 POKE 54016,0:POKE 54016,128:REM turn sound off
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	15739	20	16897	30	11363
40	11090	50	16605	60	16405
70	9681				

polarised components are the right way round, all leads are correctly soldered and there are no stray blobs or threads of solder bridging adjacent tracks. Attach the two joystick leads and plug the unit into the computer, ensuring that lead 1 goes to port 1 and lead 2 to port 2.

Now plug in the AC supply, switch on and adjust the volume control to its half-way position. You should be able to hear a faint hiss from the speaker. If not, unplug everything and check the board again paying particular attention to components that must be inserted the correct way round.

When all is well, type in Program 1 and run it. The box should say "OW". Now you can experiment with other values for A (line 10) to explore the range of sounds it is possible to produce.

Many of these are not recognisable as speech sounds until they are strung together with appropriate delays and pauses between them. We'll explain how to make this possilble next month.

Fitting the unit into a case presents no major difficulties, but be sure to drill an accurate hole for VR1's spindle. It will move about 4mm vertically and 2mm from side to side so you must be within these tolerances.

The AC socket, if you're using one, needs a 9mm square hole which can be cut with a fretsaw or carefully pared out from a 9mm round hole using a Stanley knife. The speaker can be attached to the case by self-adhesive pads and a pattern of holes will serve in lieu of an expensive grille.

Next month we'll print out the allophone set and show you an easy way of generating meaningful speech.

Parts required for speech synthesiser

Resistors			**Maplin Code**
R1	100k	Brown/black/yellow	**M100K**
R2	4.7k	Yellow/violet/red	**M4K7**
R3,R4	33k	Orange/orange/orange	**M33K**
R5	33 ohm	Orange/orange/black	**M33R**
R6	1 ohm	Brown/black/black	**M1R**
VR1	10k	Log pot (switched)	**FW63T**
Single-ended Electrolytic Capacitors			
C1	470 mfd 25v		**FF16S**
C8	1 mfd 100v		**FF01B**
C9	100 mfd 10v		**FF10L**
C12	220 mfd 16v		**FF13P**
Other capacitors			
C2,C3,C13	.01 mfd disc ceramic		**YR73Q**
C4,C5	12pf Ceramic (marked "12p")		**WX45Y**
C6,C7	22nf Ceramic (marked "22n")		**WX78K**
C10	.22nf Ceramic (marked "n22")		**WX60Q**
C11	.22 mfd polyester film		**BX78K**
Semiconductors			
IC1	uA7805UC 5v regulator		**QL31J**
IC2	SPO256 Speech Processor chip		**QY50E**
IC3	TBA820M Power Amplifier		**WQ63T**

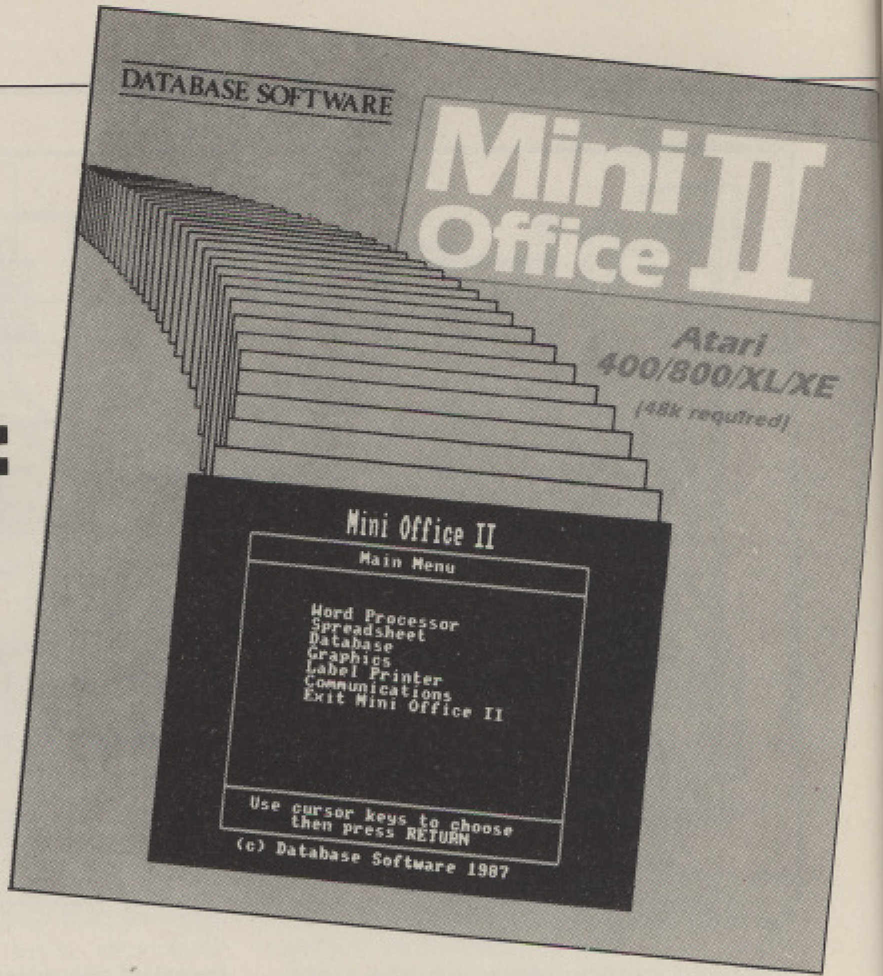
Miscellaneous	**Maplin Code**
8 ohm miniature speaker	**YW53H**
28 pin DIL socket	**BL21X**
8 pin DIL socket	**BL17T**
Twisted-vane heat sink	**FL58N**
12-way PC terminal block	**RK74R**
2-way PC terminal block	**FT38R**
2.5mm power socket	**FT97F**
Control knob for VR1	**FE75S**
Case (eg Maplin ABS box MB5)	**YN40T**
Pack of 1/8" x 6BA spacers	**FW33L**
Pack of 1/2" x 6BA c/s bolts	**BF12N**
Pack of 6BA nuts	**BF18U**
Pack of Adhesive pads	**HB22Y**

All available from Maplin Electronic Supplies Ltd. PO Box 3, Rayleigh, Essex, SS6 8LR. Cost around £13.80 plus case.

1 PCB *(Order code DBP14, price £2.95)*
2 Joystick extension leads *(order code AT111, price £2.99 each)*

Available from RH Design, 137 Stonefall Avenue, Harrogate, North Yorkshire, HG2 7NS

Take the tedium out of office chores



ALAN GOLDSBRO reviews a package useful in both home and office

THE Atari 8 bit computer, so long seen as only a games machine, takes on a new role with a feature-packed integrated system consisting of the six most essential pieces of business software in a single, user-friendly integrated package.

Mini Office II, from Database Software, has taken the 8 bit business market by storm. It puts together a range of programs you'd expect to be available only on more powerful computers.

The package comes on disc and is supplied complete with a well-written manual. There are six constituent parts to Mini Office II: A word processor, database, spreadsheet, graphics system, communications system and a label printer program.

Each of the six modules is self-contained and functions independently of the others, yet remains faithful to the design philosophy of an integrated suite of programs.

The solid base from which Mini Office II operates is the framework of an excellent menu-driven system which is standard throughout the six modules.

They ease the user into a friendly environment and yet tackle the many different and comprehensive features head on with superlative quality and efficiency.

When you boot the disc you are presented with the main menu where you select the required module using the cursor keys and Return. The computer accesses the disc for the module to be loaded into ram and each one has its own series of menus from which options are chosen.

Looking at the word processor first, there are lots of further options available. Text can be created in either 20 or 40 column mode, edited and then previewed in 80 columns on another screen.

There are so many features in the word processor that there isn't room to describe them all here. Suffice to say that standard features such as Search and Replace, Cut and Paste, Justification, Insert and Overwrite modes are available.

Other features are Headers and Footers, automatic Page numbering, Merge text and Caps conversion to name just a few. Some features that you would expect to find on more expensive word processors are missing but the features in the Mini Office II word processor are more than adequate for most situations.

Many of the commands are available from the built-in menus but the programmers have also included a mechanism for embedding the majority of commands directly into your text without even leaving the editing screen. In common with all the modules your work can be output to either an Epson compatible printer or directly to an Atari 1029 dot matrix printer. Print commands are available from the menu or can be embedded into text.

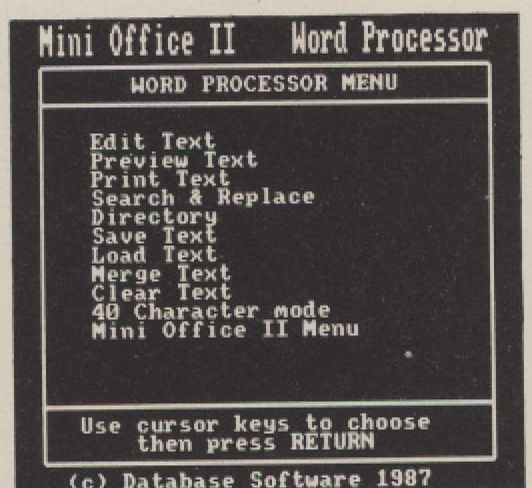


Figure I: Word processor menu

They can cope with different styles of print, line spacing, margins, header and footer offsets and number of copies. Text files which are too large to sit in ram can be chained together when printing out.

In the field of business software, databases are essential. The one in Mini Office II allows five types of field: Alpha, decimal, integer, date and formula. It's the final field which probably has the greatest power with not only the standard operators but many others often only found in spreadsheets.

Creating your database and entering records are done from separate screens and both are easy operations. Records can be scrolled forward and backwards either singularly or in groups of 10 or 100.

Individual records can be marked manually or automatically, and marked records can be used to create a sub database from your main one which can be saved to disc as a separate file.

Searching for data follows the same easy style: Select on any field using standard operators such as equal to, not equal to, greater than or less than. Sorting data can be progressive all over your fields and indexed in ascending or descending order.

Mini Office II has some of the best facilities seen in an 8 bit database. Not only can you calculate formula fields on screen but any numerical field can be totalled across a whole data file.

Merging with another Mini Office II database file presents no problems.

When it comes to printing records you'll find all the commands and structures that were so evident in the word processor. Records can be printed vertically or horizontally across the page and printer commands can be typed in to customise style and pitch.

As you'd expect from an integrated package, all the data can be used in either the word processor or label printer modules. I wish all databases could be this easy to use.

Mail merging is one of the additional niceties of Mini Office II. By using the word processor to define your letter you can send many people the same letter personalising each by merging their names and addresses from your database to the letter.

An essential feature of a successful office environment is the ability to forecast cash flow and financial viability. Spreadsheets are ideal for this and the one in the Mini Office II package is more than capable of looking after all that number crunching.

You enter data into cells by placing the cursor on top of the cell, typing in your value and pressing Return. Columns can be sized up to 18 characters wide and all the standard operators found in most spreadsheets are available. Calculations – the main part of any spreadsheet – can be carried out automatically or manually.

Cells may be replicated, justified and formatted to accept the usual types of commands and styles associated with large numbers and monetary applications.

Formulae can be replicated either absolutely or relatively or even a mixture of both. Some of the more powerful replicate functions of more powerful spreadsheets are lacking but the features available are adequate.

Loading and saving the Spreadsheet is standard, and partial save is also available. Cells can be jumped by using the effective 'Goto' command and titles can be centred and frozen to assist input. The formulae constructions can be displayed on either screen or printer and the expected range of commands are available for the printer routine.

An impressive help screen is available for the numerous commands associated with managing the module and to wrap up this section there's the opportunity to save up to 20 rows or columns to disc in a form that enables the Graphics option of Mini Office II to read in as a data set.

The Graphics module provides a powerful yet simple way to get your computer to display numeric data in an easy-to-understand form. It can be used in two ways: By entering data directly from the keyboard or by loading spreadsheet data that has been previously stored on disc.

Graphs include Bar, Line and Pie Charts with further options of 2D or 3D displays. Up to three data sets can be used to create your graph and each data set can hold between two and 20 values.

Scaling of graphs can be manual or automatic with a grid option for visual clarity. Text can be added and overlaid



Figure II: Graphics options

anywhere on the screen. Icons, normally only seen in 16 bit programs, add a visual effect to an already impressive display of graphical data representation.

Pie charts can be selected from any of the three data sets with a range of fill options to ease identification of data. The bar graphs can display all three data sets at once either side by side or stacked. Negative values can be displayed visually and accurately.

Individual screens can be saved to disc and if required, printed out any time by Mini Office II or independently by a suitable graphics program. Alternately, the stored screens can be used in other applications such as a slide show.

Again, print routines are for both Epson and 1029 printers plus you can print to a disc file for insertion into a word processor file between text. How's that for integration?

Going online with Mini Office II takes all the hard work out of linking your computer to another. The Mini Office II Communications system has been designed to work with both the Atari 850 interface and suitable modem and the Miracle Technology's DatAtari RS232 interface cable and modem.

Standard protocol options such as Microlink/Telecom Gold at 300/300 and 1200/1200 baud rate are part of the main menu. Communication protocols between other systems can be customised and links to bulletin boards worldwide can be set up with Mini Office II.

One powerful feature of this module is the macro keys which allow you to define a single key press to send quite long and complicated messages to the remote computer. Up to ten keys can be defined with 240 characters reserved for each macro.

The module is ideal for accessing systems such as MicroLink or bulletin boards, but unfortunately can't be used to access Prestel.

The final module is the Label printer – a handy feature in itself but when combined with information from your database makes a nice auto labeller.

Labels can easily be designed on screen using the editor, incorporating information from your database if required. You can produce address labels, stock labels or anything you set your database up to do. Alternatively, the module can work independently from the database to produce up to a 100 repeated labels.

The label printer can print text or data fields anywhere on the label. Their depth and width can be controlled and they can be printed more than one web wide. Label formats can be saved to disc so once you've created a design it can be accessed at any time. Test prints and printer controls are menu options that can enhance the quality of your labels.

There are a number of features not yet discussed that are available in every module. The screen colours can be changed right through the whole 256 variations, there's an invaluable overwrite/bak option when saving files and a mini dos sits in memory allowing you to see directories and use associated functions such as delete and format.

Without doubt Database Software has broken all records in producing an excellent suite of programs useful both in the home or small office. The result is a superb blend of stand alone programs packaged together for the price of a single program. It may lack a few of the features of more expensive packages but at £19.95 it's the best value business program available for the 8 bit Atari market.

Product: Mini Office II
Price: £19.95
Supplier: Database Software, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY

MicroLink NEWSLETTER

in association with TELECOM GOLD

Take off with MicroLink

THE British Airline Pilots Association – BALPA – has marked its golden jubilee by joining MicroLink.

Trade union for 6,000 commercial pilots, BALPA negotiates with 30 UK airlines and a similar number of foreign flag carriers who employ its members.

"We celebrate our 50th birthday this year, so it seemed an appropriate time for us to log on to the new information technology", said a spokeswoman. "Until now we've depended on the telephone – our office didn't even have telex.

"A very high proportion of our members are computer and communications enthusiasts when they're not flying. They'll be happy now MicroLink has provided facilities for two-way electronic messaging between themselves and BALPA.

"Apart from improving contact with our members, we'll be able to use electronic mail and telex to communicate with airlines and other pilot associations throughout the world".

Legal advice goes online

MICROLINK has scored yet another world first by taking on board a unique electronic legal and financial service for firms and individuals.

Insight provides round-the-clock legal advice, help with tax and VAT problems, and insurance cover against the cost of litigation.

It serves a wide range of personal and business needs resulting from minor problems like disputes with neighbours up to full scale Customs & Excise investigations.

A team of 50 solicitors and barristers provides a 24-hour legal advisory service. Any legal problem can be dealt with either by electronic mail or telephone. Full written advice on complicated matters is promised within 24 hours.

There is a legal fees insurance package covering solicitors' and barristers' fees, court costs, witness expenses, and opponents costs in certain cases.

Personal financial advice – on banking, pensions, insurance and tax – is offered during office hours and available in most cases through a local number. Written reports can be provided within 24 hours and consultants are available for personal visits.

Business membership of Insight also includes a wide range of special assistance for companies, covering such areas as staff insurance, tax, cash flow forecasting, pension scheme analysis and employee benefits.

Companies can also buy an Inland Revenue and VAT protection service, in the event of in-depth tax, PAYE or VAT investigation.

Company accountants can draw on advice from former Inland Revenue and Customs & Excise inspectors and get professional representation at hearings and tribunals. Up to £25,000 towards professional fees for preparing a case is included in the protection.

Two brand new Insight services will benefit from the immediacy of MicroLink communications. The first provides on-line mortgage quotations and information for property buyers.

The other supplies details about commercial finance, venture capital and other forms of commercial funding for established businesses and start up schemes alike.

Insight, operated by Investment Marketing Services, is an electronic mail extension of the IRPC legal and tax advisory service which has been operating for seven years and has half a million UK subscribers.

Calling all subscribers

THE latest technological advance on MicroLink allows subscribers to enjoy all the communications benefits of radiopaging for as little as 36p a day.

Thanks to a link-up with British Telecom's national radiopaging service, it means that MicroLink electronic mail and telex transmissions need no longer stay unnoticed on reaching their destination. And users won't be put to the trouble of accessing their mailbox when it's empty.

As soon as an Email or telex message arrives the radiopaging service is automatically alerted and the subscriber gets a "bleeper" call.

The same procedure takes place in the opposite direction – messages to other people can't be ignored or overlooked if the addressee carries a radiopaging device.

There are also all the other advantages of radiopaging – like keeping users constantly in touch with their base.

CONSORTIUM FOR COMMS

A UNIQUE association of community groups involved in computing has gone on-line with MicroLink.

Hackney Info Tech Consortium is a non-profit company formed by 45 adult education institutes, training schemes and local voluntary organisations in the London borough.

It supports member organisations – including the City of London Polytechnic – that use computers for administration, maintaining databases, and courses in programming, business computing, design and desktop publishing.

Consortium executive director David Cheetham said:"MicroLink will help our assessment of socially useful applications of new technology – particularly the potential for development of a local online community database.

"We envisage starting with a directory of education, training and leisure information then gradually allowing local organisations, co-operatives and trades unions to set up closed user groups".

YOUR chance to join MicroLink – turn to Page 4

RHYTHM AT THE RIGHT PRICE



IAN WAUGH reviews Microrhythm's – digital drums.

HOW do you fancy a digital drum kit for £1.99? I thought so!

Microrhythm is a product of the ingenuity of 2-Bit Systems – the boys responsible for Replay and Midi Master which we reviewed in the July issue of *Atari User*. It uses samples of actual drums which were recorded with their Replay system at a rate of 10kHz.

In fact, if you read that review you'll see that the Digidrum program supplied with the cartridge is virtually identical to Microrhythm. In case you missed it – shame on you – here are a few more details.

The main screen uses a system of pull-down menus containing the following options: Pattern, Play, Edit, Tempo, Song and File. Pattern lets you select any one of 29 patterns. You can wipe them all at once or individually.

Edit displays a grid containing the selected pattern with the drums listed down the left. You highlight a drum with Select, Shift moves the cursor on the grid to the right and a drum is toggled on and off the cursor position with Start. The process could have been a bit easier, but it works fine.

The program loads with eight drum sounds, but only two can sound at the same time. The bass, snare, mid-tom and low-tom are mutually exclusive as are the cowbell, closed hi-hat, open hi-hat and hand claps. You can still write some good rhythms though.

Having programmed a few patterns you move on to the Song menu to string them together. A song can hold up to 32 steps and each consists of a pattern number and the number of times it is to repeat. If the pattern number is 0, the song will jump to the pattern number given in the repeat part of the step. If both are 0 the song will restart.

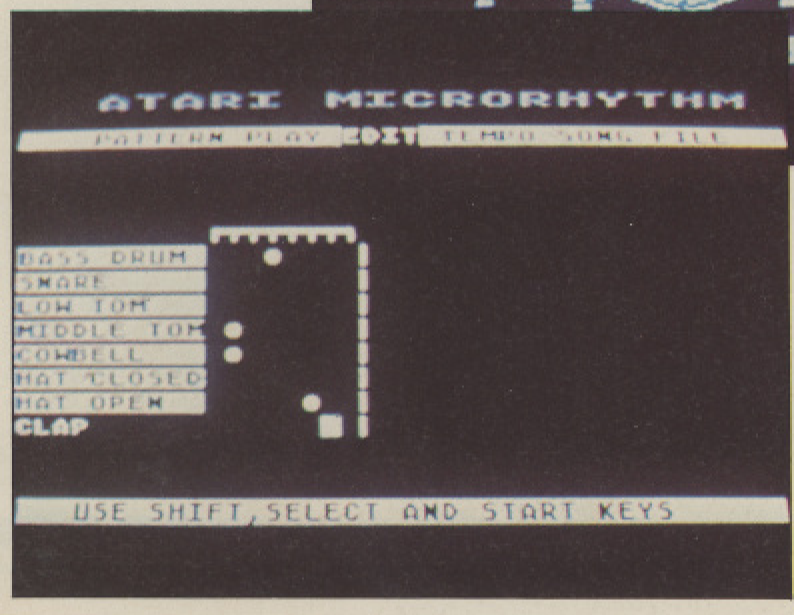
File is where you save and load songs and patterns.

Some of the procedures you have to go through are a bit messy. For example, why can't you select another pattern from the edit screen and why can't you play a pattern from there too?

Still, what can you say for £1.99? I say go to your nearest software shop and buy one.



The title screen



The edit screen

Product: Microrhythm
Price: £1.99.
Supplier: Firebird Software, 64/76 New Oxford Street, London, WC1A 1PS.
Tel: 01-379 6755

The Atari 520 ST gives you the power to defeat deadly enemies, slaughter monsters and outwit cruel captors.



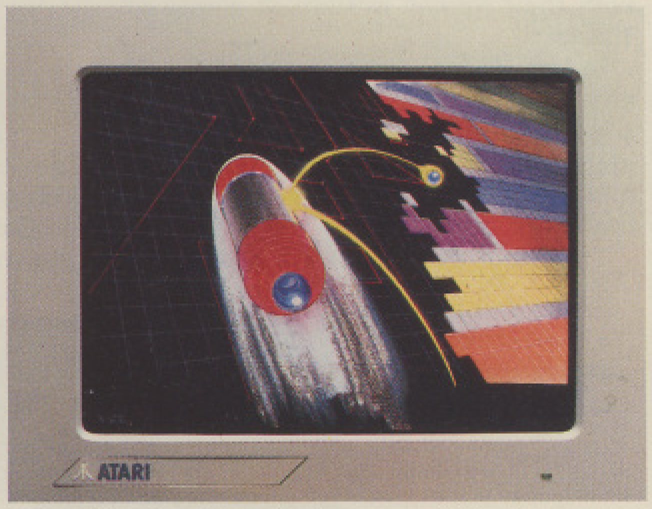
Gauntlet – U.S. Gold. Enter a world of monsters, mazes, mystery and combat in the ultimate role-playing fantasy game.



Tai Pan – Ocean. Voyage to 19th Century Hong Kong for action and excitement with pirates, smuggling and mutiny.



Metrocross – U.S. Gold.* It takes lightning reflexes to get past the potholes, obstacles and forbidden zones to reach the other side. And that's just the beginning!



Arkanoid – Imagine.* The latest smash-hit coin-op game! Are your reactions quick enough to handle 33 different play screens?



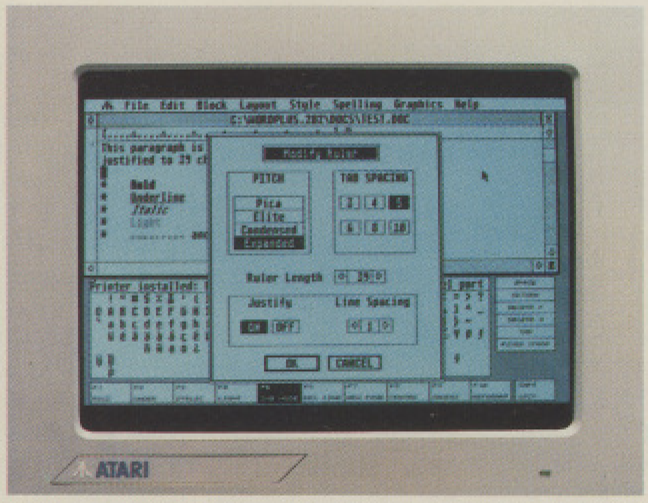
Star Raiders – Atari. Star Raiders are the only force strong enough to hold off the Zycroids. Your task is to command the Starcruiser – are you up to it?



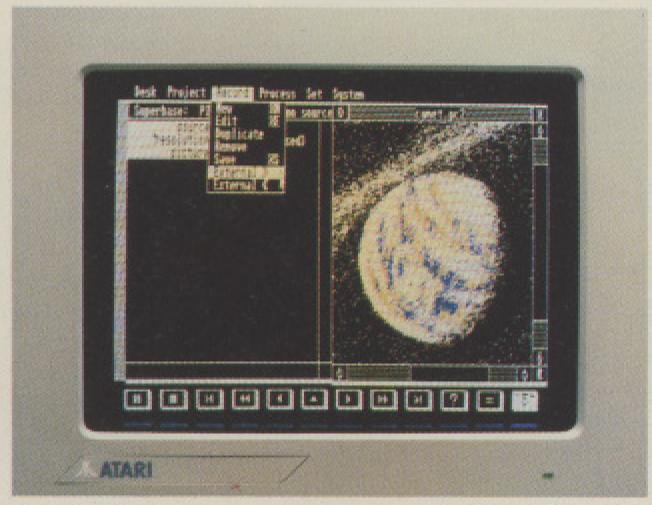
Flight Simulator II – Sublogic. Take the controls of a Cessna 182 or Learjet 25G. With high speed 3D graphics for take-offs, landings and acrobatics, it's just like the real thing!

*Screenshots are f om the

But it's not all fun and games.



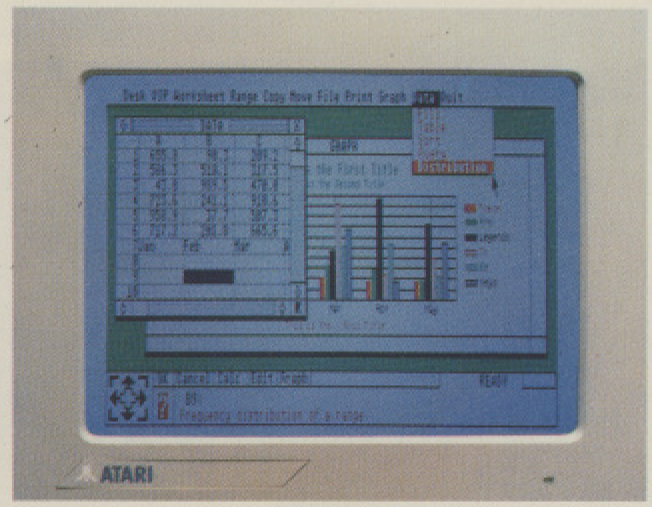
1st Word Plus – G.S.T. Professional word processor featuring U.K. spellings and integration of graphics including 1st Mail for full control of form letters etc.



Superbase Personal – Precision Software. All the features of GEM combined with full relational database power. Easy to set up, flexible, plus unique picture index facility.



Fleet Street Publisher – Mirrorsoft. The complete desk-top publishing package. Gives you page make-up combining text and graphics for sophisticated, professional looking documents.



VIP GEM – Silica Distribution. VIP Professional is an integrated spreadsheet, database, and graphics package. GEM environment plus Lotus 1-2-3 compatibility.

Mixing business with pleasure is no problem with an Atari 520 ST. Not when you've got over 1,000 software titles to choose from.

You'll find all the latest games and a huge range of business titles from the top business software houses. And the range is growing all the time.

You won't be short of power, either. The Atari 520 ST is twice as powerful as most business micros.

So you'll be able to create spectacular colour graphics. Even animate them to make your own films.

If you're musically minded, you can compose and play a full symphony.

Or, for those who'd rather write programs than music, the 520 ST supports over thirty programming languages.

In fact, whatever you're looking for in a computer, you'll find it in the Atari 520 ST.



ATARI 520 ST

WORKS HARD · PLAYS HARD

ots are fr om the original Arcade game. If you require any further information concerning software featured please write to: PO Box 555, Atari House, Railway Terrace, Slough, Berks SL2 5BZ

Your HINTS & TIPS

Goonies

ON the first screen move one of the Goonies up to the attic where the printing press is and start printing some money. When the woman goes to get the money move the other Goonie down, go behind the water tank and jump diagonally at it. This knocks it over and makes the trap door open.

On the second screen, when the bat has gone past you, get on the lift and go to the bottom. Change to the other Goonie and move him to the end and when the bat has gone past again get on the lift and go down, but drop off on the ledge above the ladders.

Move the Goonie at the bottom onto the machine and this will move the rock. Move the other Goonie on to the barrel and move him out a bit. Move the first Goonie to the left, dodge the pots, jump on to the ledge and get the key. This will open the door at the bottom.

On the third screen move one Goonie up to the man who is having the shower and move him across the pipe, being careful of the steam.

Move the other Goonie to the pipe and then move the first Goonie down. A man with a gun will appear and you move the Goonie who is nearest the thinnest pipe up to the second set of ladders. The pipe will burst and you can get out.

On the fourth screen, don't move anywhere until the bats (that arrive when the bells ring) leave. Then trap the cannon balls by jumping on and off the little objects that come off the roof. Stand on the object at the bottom of the roof and the slates will disappear one at a time.

On the fifth screen collect all the skulls and push them to where there are already two skulls. To get on to the skulls from the roof, bounce on the object underneath the bones.

You need five skulls on the ladder to allow you to move to the next screen. – *Marcus Eaton, Halifax.*

Vegas Jackpot

HERE is the arrangement of each reel, so you know how many nudges are needed for the most money.

Reel 1	Reel 2	Reel 3	Reel 4
Chip 3	Chip	Chip	Chip
Plum	Lemon 1	Cherry 1	Lemon
Apple 2	Pear	Lemon	Plum
Cherry 1	Apple	Plum	Lemon
Pear	Lemon 2	Straw	Apple 2
Straw	Plum	Cherry 3	Pear
Plum 2	Melon	Apple	Cherry 1
Melon	Cherry 3	Lemon	Plum
Chip	Pear	Cherry 2	Lemon
Pear 1	Straw 1	Pear	Cherry 3
Cherry	Pear	Straw	Apple 1
Melon	Apple 2	Pear 1	Plum
Cherry 3	Melon	Melon	Melon 1
Straw	Lemon	Pear	Cherry 1
Plum 1	Pear 1	Cherry 2	Straw
Cherry	Melon	Plum	Lemon 2
Chip	Pear 2	Straw	Apple
Plum	Lemon	Lemon 1	Plum
Lemon 2	Melon 1	Apple	Lemon 3
Plum 3	Apple	Cherry	Pear
Lemon	Plum	Pear 2	Cherry
Straw	Straw	Cherry	Apple 2
Cherry 1	Lemon 1	Pear	Lemon

David Baxter and Franny, Runcorn.

Leaderboard.

IF you are having problems taking a lot of shots getting past the green, press Break and you will go past the hole with the amount of shots you have taken registered on the Leaderboard. This can be used to get to your favourite holes quickly. – *Bill Jordan, Hook Norton, Oxon.*

Ninja

AFTER collecting all six idols a secret trapdoor should appear in the top of the Grey Wall. Go through it and you should be in a blue room. Kill all the people and collect the last idol. After doing that go back to the beginning to complete the game. – *Paul Shaw, Oldham, Lancs.*

Mercenary

WHILE you are holding it, the anti time bomb is used to repair damaged buildings. Just fire at the remains of a building and it will rebuild instantly.

The metal detector shows who owns a particular building by displaying a colour in the message window. Green is a palyar building, blue is a mechanoid building, and red shows no one owns it. – *Paul Shaw, Oldham, Lancs.*

Superman

PRESSING the Break key repositions Superman when he is in trouble. But be careful – this can also get you into more trouble if you're unlucky. – *Bill Jordan, Hook Norton, Oxon.*

Summer Games

ON the 100 metres, waggle your joystick round and round instead of left and right or up and down to get fantastic times. – *Bill Jordan, Hook Norton, Oxon.*

Spellbound

SMASH the glowing bottle by dropping it and use the broken glass to read the engraved candle. The mirror displays your energy and the objects at the bottom of the screen.

The crystal ball can be used to locate people, except when you are in the lift. – *Paul Shaw, Oldham, Lancs.*

Montezuma's Revenge

AT the start get to the top of the rope. Keep pressing Select, pull the joystick down and you will go down into a different room. – *David Baxter and Franny, Runcorn.*

Star Raiders II

WHEN you are in the other star system and short on energy but don't have enough time to go to a space station to refuel, get energy by going to the sun. Once you are there you will have to get away quick or you will melt. If you do get away you will find your fuel tank is full. – *Paul Shaw, Oldham, Lancs.*

To help you destroy the aliens



and defeat the taxman,



we've massacred the price.



For a limited period, the Atari 520 STM is even more of a knockout than usual.

We're offering it for just £449.95 (inc. VAT) complete with SF354 disk drive, SM125 mono monitor,* a mouse worth £24.95 and 1st Word, worth £49.95.

So as well as saving you from the enemy, the 520 STM will also save you £184.

You'd better hurry though, because it won't be long before our stocks are wiped out.

ATARI 520 STM
WORKS HARD · PLAYS HARD

*Offer includes mono monitor. The 520STM plugs into a standard colour T.V.

Dump that screen . . .

Print your favourite pictures with this routine from KEVIN MILFORD

THE Atari 1029 graphics printer has never been backed up by many programs to produce screen dumps, and with the exception of Mini Office II has never been fully compatible with most word processors on the market.

At last, here's a utility that allows you to produce hard copies of your favourite pictures either on an Atari 1029 or Epson compatible printer.

To use this utility you must have GR.15 pictures already stored in file format on disc. The kind of file produced by pressing the insert key while using AtariArtist or any of the Micro Painter files that have been converted are good examples of pictures to use.

When you run the utility the screen will go blank for a few moments while the program initialises, then you will be asked to input your printer type – Atari or Epson.

After replying A or E you are asked for the picture filename which must always be entered in the form: D:FILENAME.EXTENDER. The program will then load the picture and display it in four shades of grey.

If the luminance distribution is not how you want it, press C and a single beep will sound. You can then swap the luminance value of the colour registers around by pressing the numeric keys 0 to 3 inclusive.

The program takes the key presses in pairs, so if you press 0 and 1 the values of these two registers will be exchanged. You may continue to swap the values until the luminance of the picture is to your liking.

Once you have the picture how you like it, press Escape followed by P. Two beeps will be heard and the picture will then begin to be printed out after a slight pause. It takes a while to print out a full screen and it is printed four lines at a time with a pause as the next seven screen columns are calculated.

Essentially the program works by converting seven columns of screen display into four rows of printer information. This is achieved by using the colour register information gained by the LOCATE command to index a series of arrays, which will give the pin density pattern required for the luminance obtained.

This is then fed into a further series of arrays ready for printing. The screen display contains four luminances – 0, 5, 10 and 15.

The array REG contains the addresses of the colour registers 0 to 3 in sequence, so that PEEK(REG(0)) would return the value for register 0. Lines 165 to 225 obtain the colour register used at a screen location which is divided by three to give a luminance range of 0 to 3 (black to white).

Each pixel is four printer pins long and two pins high. Figure I shows the printer pin patterns used to represent the luminance range 0 to 3. As the printer head contains seven pins, seven screen columns are interpreted into four printer rows at the same time.

This gives rise to the high number of pattern arrays holding the decimal equivalent of the pin patterns. For example PAT1(0,0) holds the first column of pattern 0.

Each pattern array has a direct relationship with one of the printer row arrays PR1 to PR4. The contents of the pattern arrays are sent to the printer by lines 275 to 310 of the program.

The CHR$ statements in the first PRINT statements set the printer up for high density (GRAPHICS) printing.

Line 315 prevents the program going into the attract mode, and line 320 indicates the end of the loop. The FOR...NEXT loops of X and Y control the area of the screen being translated. Once the picture has been printed the program returns you back to Basic. If you want to print another picture, just type RUN.





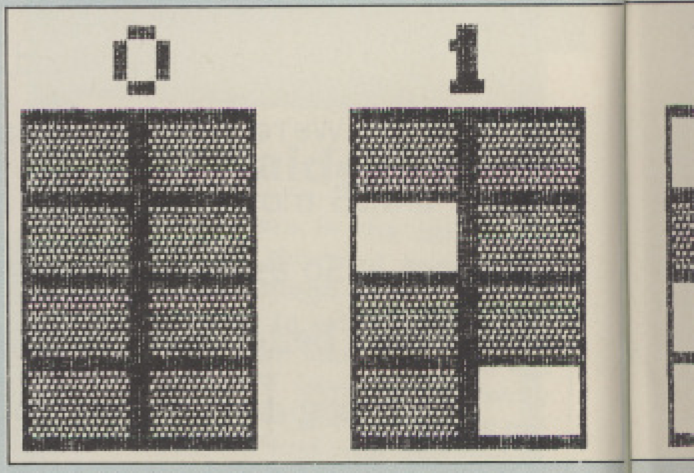
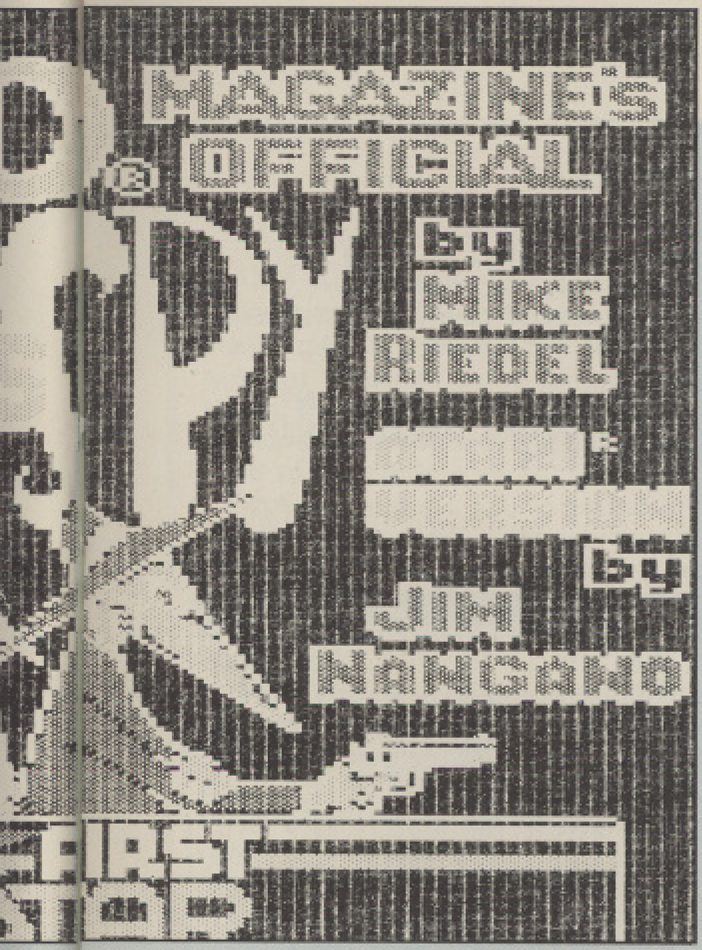
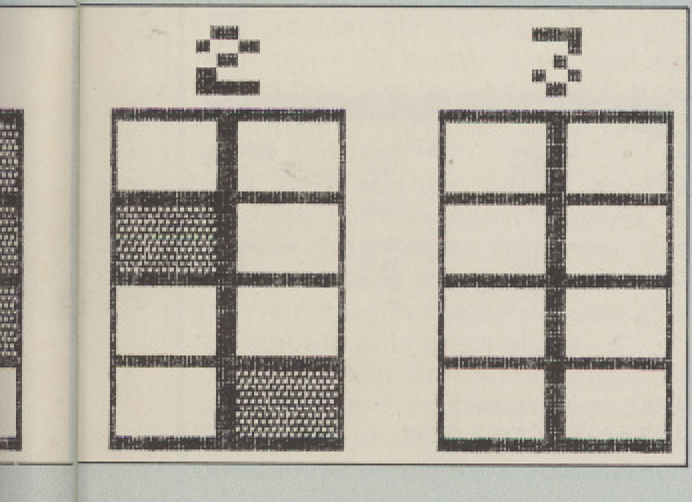


Figure I: Atari 1029 printer pin pattern







PROGRAM BREAKDOWN

- **100-105** Set graphic mode and variables.
- **106-115** Find out your printer option and the filename of the picture.
- **165-225** Obtain the colour register and work out luminance value.
- **230-265** Sort pattern arrays.
- **270-310** Send the array values to the printer.
- **315** Prevent the computer going into attract mode.
- **320** Indicate end of loop for the area of screen being interpreted.

```
90 REM ****************************
91 REM * GRAPHICS 15 SCREEN DUMP *
92 REM ****************************
100 GRAPHICS 0:DIMF$(20),REG(4),PR1(48
0),PR2(480),PR3(480),PR4(480),PAT1(4,2
),PAT2A(4,2),PAT2B(4,2)
105 DIMPAT3(4,2),PAT4A(4,2),PAT4B(4,2)
,PAT5(4,2),PAT6A(4,2),PAT6B(4,2),PAT7(
4,2):GOSUB 1400
106 ? :? "Atari 1029 or Epson ?";
107 OPEN #1,4,0,"K:":GET #1,KEY:CLOSE
#1
108 IF KEY=ASC("A") THEN PRNT=1:GOTO 1
11
109 IF KEY=ASC("E") THEN PRNT=0:GOTO 1
11
110 GOTO 107
111 ? :? :? "Enter Picture Filename":?
 :? "Dx:xxxxxxxx.xxx":?
115 ? :INPUT F$
120 GRAPHICS 31:POKE 712,0:POKE 708,5:
POKE 709,10:POKE 710,15
125 CLOSE #1:OPEN #1,4,0,F$
130 Q=USR(1536,7):CLOSE #1
135 GOSUB 1200:REM GET KEY PRESS
140 IF K<>67 AND K<>80 THEN 135
145 IF K=67 THEN GOSUB 1100:GOSUB 1000
:GOTO 135
150 FOR F=1 TO 2:GOSUB 1100:FOR D=1 TO
 10:NEXT D:NEXT F
155 FOR N=0 TO 439:PR1(N)=0:PR2(N)=0:P
R3(N)=0:PR4(N)=0:NEXT N
160 FOR X=0 TO 159 STEP 7:C=0:FOR Y=19
1 TO 0 STEP -1
165 LOCATE X,Y,P1:P1=INT(PEEK(REG(P1))
/5)
170 IF X+1>159 THEN P2=3:P3=3:P4=3:P5=
3:P6=3:P7=3:GOTO 230
175 LOCATE X+1,Y,P2:P2=INT(PEEK(REG(P2
))/5)
180 IF X+2>159 THEN P3=3:P4=3:P5=3:P6=
3:P7=3:GOTO 230
185 LOCATE X+2,Y,P3:P3=INT(PEEK(REG(P3
))/5)
190 IF X+3>159 THEN P4=3:P5=3:P6=3:P7=
3:GOTO 230
195 LOCATE X+3,Y,P4:P4=INT(PEEK(REG(P4
))/5)
200 IF X+4>159 THEN P5=3:P6=3:P7=3:GOT
O 230
205 LOCATE X+4,Y,P5:P5=INT(PEEK(REG(P5
))/5)
210 IF X+5>159 THEN P6=3:P7=3:GOTO 230
215 LOCATE X+5,Y,P6:P6=INT(PEEK(REG(P6
))/5)
220 IF X+6>159 THEN P7=3:GOTO 230
225 LOCATE X+6,Y,P7:P7=INT(PEEK(REG(P7
))/5)
230 PR1(C+48)=PAT1(P1,0)+PAT2A(P2,0)
235 PR1(C+49)=PAT1(P1,1)+PAT2A(P2,1)
240 PR2(C+48)=PAT2B(P2,0)+PAT3(P3,0)+P
AT4A(P4,0)
245 PR2(C+49)=PAT2B(P2,1)+PAT3(P3,1)+P
AT4A(P4,1)
250 PR3(C+48)=PAT4B(P4,0)+PAT5(P5,0)+P
AT6A(P6,0)
255 PR3(C+49)=PAT4B(P4,1)+PAT5(P5,1)+P
AT6A(P6,1)
260 PR4(C+48)=PAT6B(P6,0)+PAT7(P7,0)
265 PR4(C+49)=PAT6B(P6,1)+PAT7(P7,1)
270 C=C+2:NEXT Y
280 GOSUB 2000:FOR N=0 TO 479:? #2;CHR
$(PR1(N));:NEXT N:CLOSE #2
290 GOSUB 2000:FOR N=0 TO 479:? #2;CHR
$(PR2(N));:NEXT N:CLOSE #2
300 GOSUB 2000:FOR N=0 TO 479:? #2;CHR
$(PR3(N));:NEXT N:CLOSE #2
310 GOSUB 2000:FOR N=0 TO 479:? #2;CHR
$(PR4(N));:NEXT N:CLOSE #2
315 POKE 77,0
320 NEXT X
325 END
1000 GOSUB 1300:IF K=27 THEN RETURN
1010 K1=K-48
1015 GOSUB 1300:IF K=27 THEN RETURN
1020 K2=K-48
1025 K1=REG(K1):K2=REG(K2)
1030 B=PEEK(K1)
1035 POKE K1,PEEK(K2)
1040 POKE K2,B
1045 GOTO 1000
1100 SOUND 0,121,10,8
1105 FOR D=1 TO 20:NEXT D
1110 SOUND 0,0,0,0
1115 RETURN
1200 CLOSE #2:OPEN #2,4,0,"K:"
1205 GET #2,K:CLOSE #2
1210 RETURN
1300 GOSUB 1200:IF K=27 THEN RETURN
1305 IF K<47 OR K>51 THEN 1300
1310 GOSUB 1100:RETURN
1400 RESTORE 1405:FOR X=1536 TO 1589:R
EAD Y:POKE X,Y:NEXT X
1405 DATA104,104,104,141,9,6,162,16,16
```

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```
9,7,157,66,3,165,88,157,68,3,165,89,15
7,69,3,169,0
1410 DATA157,72,3,169,31,157,73,3,32,8
6,228,169,12,157,66,3,32,86,228,96,0,0
,0,0,0,0,0,0,0
1415 RESTORE 1420:FOR X=0 TO 3:READ A:
REG(X)=A:NEXT X
1420 DATA 712,708,709,710
1425 RESTORE 1430:FOR X=0 TO 3:FOR Y=0
 TO 1:READ A:PAT1(X,Y)=A:NEXTY:NEXT X
1430 DATA 120,120,88,112,32,8,0,0
1435 RESTORE 1440:FOR X=0 TO 3:FOR Y=0
 TO 1:READ A:PAT2A(X,Y)=A:NEXTY:NEXT X
1440 DATA 7,7,5,7,2,0,0,0
1445 RESTORE 1450:FOR X=0 TO 3:FOR Y=0
 TO 1:READ A:PAT2B(X,Y)=A:NEXTY:NEXT X
1450 DATA 64,64,64,0,0,64,0,0
1455 RESTORE 1460:FOR X=0 TO 3:FOR Y=0
 TO 1:READ A:PAT3(X,Y)=A:NEXTY:NEXT X
1460 DATA 60,60,44,56,16,4,0,0
1465 RESTORE 1470:FOR X=0 TO 3:FOR Y=0
 TO 1:READ A:PAT4A(X,Y)=A:NEXTY:NEXT X
1470 DATA 3,3,2,3,1,0,0,0
1475 RESTORE 1480:FOR X=0 TO 3:FOR Y=0
 TO 1:READ A:PAT4B(X,Y)=A:NEXTY:NEXT X
1480 DATA 96,96,96,64,0,32,0,0
1485 RESTORE 1490:FOR X=0 TO 3:FOR Y=0
 TO 1:READ A:PAT5(X,Y)=A:NEXTY:NEXT X
1490 DATA 30,30,22,28,8,2,0,0
1495 RESTORE 1500:FOR X=0 TO 3:FOR Y=0
 TO 1:READ A:PAT6A(X,Y)=A:NEXTY:NEXT X
1500 DATA 1,1,1,1,0,0,0,0
1505 RESTORE 1510:FOR X=0 TO 3:FOR Y=0
 TO 1:READ A:PAT6B(X,Y)=A:NEXTY:NEXT X
1510 DATA 112,112,48,96,64,16,0,0
1515 RESTORE 1520:FOR X=0 TO 3:FOR Y=0
 TO 1:READ A:PAT7(X,Y)=A:NEXTY:NEXT X
1520 DATA 15,15,11,14,4,1,0,0
1525 RETURN
2000 REM CHECK EPSON OR 1029
2010 OPEN #2,4,0,"P:"
2020 IF PRNT=1 THEN GOTO 2100
2030 REM SEND CODES FOR EPSON
2040 ?#2;CHR$(27);CHR$(65);CHR$(7);CHR
$(27);CHR$(75);CHR$(225);CHR$(1);:RETU
RN
2100 REM SEND CODES FOR ATARI 1029
2110 ? #2;CHR$(27);CHR$(65);CHR$(1);CH
R$(225);:RETURN
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
90	4147	91	6152	92	4147
100	16497	105	14986	106	7130
107	6261	108	6709	109	6722
110	1636	111	14281	115	1982
120	10122	125	3950	130	4051
135	5642	140	4466	145	7914
150	9515	155	10358	160	8933
165	6899	170	10110	175	7415
180	9200	185	7426	190	8286
195	7437	200	7368	205	7448
210	6446	215	7459	220	5520
225	7470	230	5512	235	5523
240	7566	245	7577	250	7612
255	7623	260	5504	265	5511
270	2363	280	10971	290	10976
300	10981	310	10986	315	1797
320	1375	325	836	1000	5710

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1010	1265	1015	5710	1020	1268
1025	3846	1030	1937	1035	3078
1040	1912	1045	1848	1100	2734
1105	3601	1110	2321	1115	1498
1200	4328	1205	3119	1210	1498
1300	5706	1305	4406	1310	3598
1400	10335	1405	12924	1410	12916
1415	9289	1420	3310	1425	13779
1430	4418	1435	13635	1440	3202
1445	13639	1450	3922	1455	13787
1460	3973	1465	13643	1470	3158
1475	13647	1480	3987	1485	13795
1490	3875	1495	13632	1500	3134
1505	13636	1510	4425	1515	13784
1520	3848	1525	1498	2000	4459
2010	2718	2020	4830	2030	4959
2040	12755	2100	5655	2110	8496

Manipulating vector graphics

STEPHEN WILLIAMSON shows how to animate shapes

MANY Atari flight simulators and other games, such as Mercenary, use vector graphics to give the illusion of moving through three-dimensional space. This program – 3D Animation – demonstrates some of the techniques used to manipulate vector graphics.

Type in the Basic listing and save it in the usual way. Unfortunately, because of the large area of ram used for storage and the use of Graphics 14, the program will only work on an 800XL or XE.

When you run it you must first plot a shape on the screen by moving the cursor within the framed section using a joystick. To prevent an out of range error when the shape is plotted the cursor will not move to the far right or left of the screen.

To plot a point simply press the fire button and after the first point has been plotted a line will be drawn back to the last one. Points can either be plotted as foreground or background: To change, press **1** for foreground or **2** for background before plotting the point.

After drawing a shape press Start to go to the plotting routine to set the number of plotting parameters. The first is the angle of rotation which is a value between 0.1 and 0.9. A value of 0.1 means that each shape plotted will rotate by a small amount and a value of 0.9 performs an almost complete rotation.

Then set the direction in which the object rotates (forwards or backwards, clockwise or anti-clockwise).

There are three types of axis rotation and all give the effect of the shape going into the distance and then coming closer again.

Rotation 1 spins the object on a flat plane and does not highlight the foreground/background illusion. Rotation 2 makes the shape rotate through a horizontal axis and rotation 3 through a vertical axis, while rotation 4 is a combination of rotations 2 and 3.

The computer calculates and draws the 13 individual shapes that make up the animation sequence. If the maximum 40 points are used this takes a few minutes and as each shape is drawn a machine code routine stores it in ram.

To animate the shape another machine code routine transfers the stored shape data from the ram storage area to the screen ram area. The high speed of machine code gives the smooth animation effect.

To stop the animation press the spacebar and you can then either draw another shape or animate the same shape with different parameters.

You can demonstrate how foreground and background points affect a shape by entering the pyramid shown in Figure I – with all points as foreground – then animate it. Then return to the plotting section of the program and plot the shape again but with the points marked F as foreground and point B as background.

To do this correctly make sure that you are in Foreground mode (FOREGROUND is highlighted by inverse letters) to begin with and plot point F1. Move and plot F2, then F3 and back again to F4, (previously F1) in order to complete the outer triangle.

Press **2** to change to background and move to B5. Then change to foreground before plotting F6 (the same position as F3). Return to background and plot B7 and finally change to foreground to move to F8.

You'll notice that the point in the centre of the triangle is a background point and lines F3, F1 and F2 are connected to it. Because all lines are connected to each other it is often necessary to draw over a line more than once, just as if you were drawing the same shape on a piece of paper without your pen leaving the surface of the paper.

When the pyramid with background point is animated, it will appear to be in three dimensions and not as the flat surface of the shape plotted without the background point. A maximum of 40 points can be plotted at any given time.

Let's look at how the program works. By convention, in a two dimensional shape the horizontal position of a point is known as X and the vertical position as Y. So if you use the command PLOT 40,20, a pixel will be plotted at a point 40 pixels across the screen and 20 pixels from the top of the screen.

In order to represent a third dimension – depth – we can use the letter Z. Without the benefit of 3D Holograph TV we cannot actually plot 3D shapes using an Atari computer – but by clever use of perspective the mind can be fooled into thinking that a 3D object has appeared on the screen.

Figure II shows the three coordinate principle. Line X of the cube drawing represents the horizontal X axis and line Y is the vertical Y axis. Line Z is the depth or Z axis. Any point on line Z can be thought of as a measure of how far away the point is from the observer.

The program scales the Z axis so that a value of 0 gives the effect of an object on the surface of the screen. A negative Z value means that the object has left the screen and is near your eye, while a positive one takes it behind the screen. So, theoretically, an object can hit you on the head or disappear into the innards of your TV. Such is the paradox of a two dimensional world trying to simulate a three

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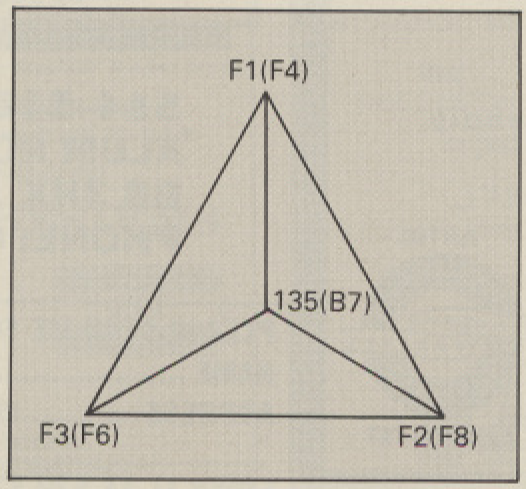


Figure I: The pyramid shape

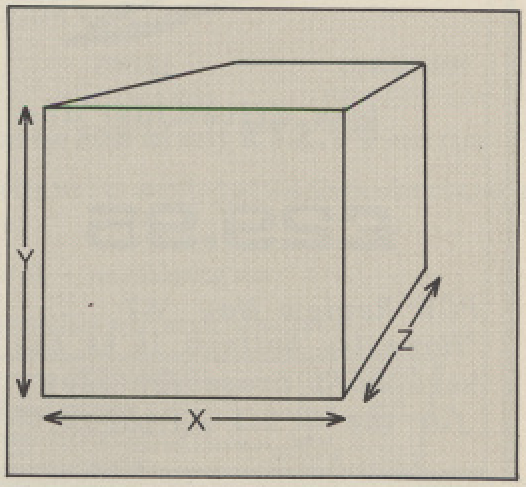


Figure II: The three dimensional view

dimensional environment.

The theory behind 3D vector plotting is complex, but a study of the program will show some of the techniques used. The variable *PNT(N,1)* is used to hold the X coordinate of each point, *PNT(N,2)* the Y coordinate and *PNT(N,3)* the Z coordinate. The variables *LINK(N,1)* and *LINK(N,2)* keep track of which point links to which.

The routines in lines 1360 to 1550 include the equations for changing the coordinates of the points after each shape has been plotted. AXIS 4 uses both the AXIS 3 and AXIS 2 routines (see line 380).

Lines 320 to 590 draw the shapes and store them in ram. Line 500 finds the *SCALE* variable which, using the Z coordinate, determines the scale of the shape. The smaller it is the further into the distance it appears to recede.

Lines 510 to 560 draw the pixels on to the screen. Note that all points are made relative to the centre of the screen by adding 79. (The program uses a Graphics 14 screen of 160 x 160 pixels).

The program has been written primarily to be fun and to show that fairly complex 3D animation sequences can be displayed without using vast amounts of complicated machine code.

Experiment with various shapes and rotations. Try altering the rotation equations (lines 1370 to 1490) or change the link relationships (variables *LINK(N,1)* and *LINK(N,2)*) and see what happens.

```
10 REM 3D ANIMATION
20 REM BY STEPHEN WILLIAMSON
30 REM FOR ATARI USER
40 REM
50 REM INITIALISE
60 GOSUB 1220
70 FOR I=0 TO 81
80 READ A:POKE 1536+I,A
90 NEXT I
100 DIM PNT(40,3),LINK(40,2),M(200)
110 GOSUB 790:GOSUB 1130
120 POKE 764,255:? CHR$(125);"Press SE
LECT to plot shapes"
130 ? "Press OPTION to erase current s
hape"
140 STORE=66
150 IF PEEK(53279)=5 THEN GOTO 190
160 IF PEEK(53279)=3 THEN GOSUB 1220:G
OTO 110
170 GOTO 150
180 REM CALCULATE AND DRAW SHAPES
190 ? CHR$(125)
200 ? "ANGLE (.1 TO .9) ";
210 INPUT ANGLE
220 IF ANGLE<0.1 OR ANGLE>0.9 THEN 190
230 ? CHR$(125);"AXIS ROTATION (1 - 4)
 ";
240 INPUT AXIS
250 IF AXIS<1 OR AXIS>4 THEN 230
260 ? CHR$(125);"DIRECTION (1 OR 2) ";
270 INPUT DIRECTION
280 IF DIRECTION<1 OR DIRECTION>2 THEN
 GOTO 260
290 IF DIRECTION=2 THEN ANGLE=-ANGLE
300 SHAPE=1:? CHR$(125)
310 GOSUB 1570
320 FOR J=0 TO 650 STEP 50
330 IF J=0 THEN ANGLE1=ANGLE:ANGLE=0
340 IF J>0 THEN ANGLE=ANGLE1
350 IF AXIS=1 THEN GOSUB 1370:GOSUB 41
0
360 IF AXIS=2 THEN GOSUB 1440:GOSUB 41
0
370 IF AXIS=3 THEN GOSUB 1510:GOSUB 41
0
380 IF AXIS=4 THEN GOSUB 1440:GOSUB 15
10:GOSUB 410
390 NEXT J
400 GOTO 600
```

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Graphics

```
410 GOSUB 1220:GOSUB 1260
420 ? CHR$(125);"SHAPE NO. ";SHAPE:SHA
PE=SHAPE+1
430 FOR I=1 TO NUM
440 X=PNT(LINK(I,1),1)
450 Y=PNT(LINK(I,1),2)
460 Z=PNT(LINK(I,1),3)+J
470 X1=PNT(LINK(I,2),1)
480 Y1=PNT(LINK(I,2),2)
490 Z1=PNT(LINK(I,2),3)+J
500 SCALE=300/(300+Z):SCALE1=300/(300+
Z1)
510 XPL=INT(X*SCALE+79)
520 YPL=INT(Y*SCALE+79)
530 X1PL=INT(X1*SCALE1+79)
540 Y1PL=INT(Y1*SCALE1+79)
550 PLOT XPL,YPL
560 DRAWTO X1PL,Y1PL
570 NEXT I
580 A=USR(1536,STORE):STORE=STORE+5:RE
M STORE SHAPES IN RAM
590 RETURN
600 REM ANIMATE SHAPES
610 GOSUB 1220
620 ? "PRESS SPACE TO STOP"
630 GOSUB 1260
640 FOR DELAY=1 TO 30:NEXT DELAY
650 STORE=66
660 IF PEEK(764)=33 THEN 120
670 FOR I=1 TO 13
680 IF PEEK(764)=33 THEN POP :GOTO 120
690 FOR D=1 TO 20:NEXT D
700 A=USR(1577,STORE):REM MACHINE CODE
 ANIMATION ROUTINE
710 STORE=STORE+5:NEXT I
720 FOR I=13 TO 1 STEP -1
730 IF PEEK(764)=33 THEN POP :GOTO 120
740 FOR D=1 TO 20:NEXT D
750 A=USR(1577,STORE)
760 STORE=STORE-5:NEXT I
770 POKE 77,0:GOTO 650
780 REM MOVE CURSOR
790 GOSUB 1220:GOSUB 1260
800 ? " 3D ANIMATION BY STEPHEN WILLIA
MSON "
810 ? "Draw shape...then press START"
820 ? "1 = FOREGROUND  2 = BACKGROUND"
830 POKE 764,255:GROUND=1:PNT(1,3)=-50
840 X=0:Y=0:P=1:FLAG=0:NUM=0
850 COLOR 1
860 PLOT X+79,Y+79
870 IF PEEK(764)=30 THEN GROUND=2:POKE
 764,255:? " 1 = FOREGROUND  2 = BACKG
ROUND"
880 IF PEEK(764)=31 THEN GROUND=1:POKE
 764,255:? " 1 = FOREGROUND  2 = BACKG
ROUND"
890 ST=STICK(0)
900 IF PEEK(53279)=6 THEN GOSUB 1330:R
ETURN
910 IF STRIG(0)=0 THEN GOSUB 1040
920 IF ST=15 THEN FOR D=1 TO 5:NEXT D:
COLOR 0:PLOT X+79,Y+79:FOR D=1 TO 5:NE
XT D:COLOR 1:PLOT X+79,Y+79:GOTO 870
930 POKE 77,0
940 IF FLAG=0 THEN COLOR 0:PLOT X+79,Y
+79
950 IF ST=14 THEN Y=Y-1:IF Y=-33 THEN
Y=-32
960 IF ST=13 THEN Y=Y+1:IF Y=33 THEN Y
=32
970 IF ST=11 THEN X=X-1:IF X=-51 THEN
X=-50
980 IF ST=7 THEN X=X+1:IF X=51 THEN X=
50
990 LOCATE X+79,Y+79,A:IF A<>0 THEN FL
AG=1
1000 IF A=0 THEN FLAG=0
1010 COLOR 1:PLOT X+79,Y+79
1020 GOTO 870
1030 REM PLOT POINT AND DRAW LINE
1040 GOSUB 1330:FLAG=1
1050 NUM=NUM+1:IF NUM=40 THEN ? "MAXIM
UM NUMBER OF POINTS":FOR DELAY=1 TO 10
0:NEXT DELAY:POP :GOTO 120
1060 IF GROUND=1 THEN PNT(NUM,3)=50
1070 IF GROUND=2 THEN PNT(NUM,3)=25
1080 PLOT X+79,Y+79:PNT(NUM,1)=X:PNT(N
UM,2)=Y
1090 IF NUM>1 THEN DRAWTO PNT(NUM-1,1)
+79,PNT(NUM-1,2)+79
1100 LINK(NUM,1)=NUM:LINK(NUM,2)=NUM+1
1110 RETURN
1120 REM CALCULATE LINKS
1130 FOR N=1 TO NUM
1140 LINK(N,1)=N:LINK(N,2)=N+1
1150 M(N)=PNT(N,1):M(40+N)=PNT(N,2)
1160 M(80+N)=PNT(N,3):M(120+N)=LINK(N,
1):M(160+N)=LINK(N,2)
1170 NEXT N
1180 LINK(NUM,1)=NUM:LINK(NUM,2)=NUM
1190 M(120+NUM)=NUM:M(160+NUM)=NUM
1200 RETURN
1210 REM GRAPHICS 14 SCREEN
1220 GRAPHICS 14:COLOR 1:POKE 708,14:P
OKE 710,0
1230 POKE 752,255
1240 RETURN
1250 REM DRAW FRAME
1260 PLOT 0,43:DRAWTO 159,43:DRAWTO 15
9,113
1270 PLOT 0,43:DRAWTO 159,43:DRAWTO 15
9,113
1280 DRAWTO 0,113:DRAWTO 0,43
1290 PLOT 1,44:DRAWTO 158,44:DRAWTO 15
8,114
1300 DRAWTO 1,114:DRAWTO 1,44
1310 RETURN
1320 REM SOUND
1330 SOUND 0,128,10,15
1340 FOR DELAY=1 TO 30:NEXT DELAY:SOUN
D 0,0,0,0
1350 RETURN
1360 REM AXIS 1
1370 FOR N=1 TO NUM
1380 L=PNT(N,1)
1390 PNT(N,1)=INT(PNT(N,1)*COS(ANGLE)-
PNT(N,2)*SIN(ANGLE))
1400 PNT(N,2)=INT(L*SIN(ANGLE)+PNT(N,2
)*COS(ANGLE))
1410 NEXT N
1420 RETURN
1430 REM AXIS 2
1440 FOR N=1 TO NUM
1450 L=PNT(N,2)
1460 PNT(N,2)=INT(PNT(N,2)*COS(ANGLE)-
PNT(N,3)*SIN(ANGLE)+0.5)
1470 PNT(N,3)=INT(L*SIN(ANGLE)+PNT(N,3
)*COS(ANGLE)+0.5)
1480 NEXT N
1490 RETURN
1500 REM AXIS 3
1510 FOR N=1 TO NUM
1520 L=PNT(N,1)
1530 PNT(N,1)=INT(PNT(N,1)*COS(ANGLE)+
PNT(N,3)*SIN(ANGLE)+0.5)
1540 PNT(N,3)=INT(-L*SIN(ANGLE)+PNT(N,
3)*COS(ANGLE)+0.5)
1550 NEXT N:RETURN
1570 FOR N=1 TO NUM
1580 PNT(N,1)=M(N):PNT(N,2)=M(N+40)
1590 PNT(N,3)=M(N+80):LINK(N,1)=M(N+12
0):LINK(N,2)=M(N+160)
1600 NEXT N
1610 RETURN
1620 REM MACHINE CODE DATA
1630 DATA 104,104,104,141,25,6,169,72,
141,21,6,169,148,141,22,6,160,0,162,0
1640 DATA 189,72,153,157,0,141,232,208
,247,238,25,6,238,22,6,200,192,5,208,2
34
1650 DATA 96,104,104,104,141,63,6,169,
72,141,65,6,169,148,141,66,6,160,0,162
1660 DATA 0,189,0,117,157,72,153,232,2
08,247,238,63,6,238,66,6,200,192,5,208
1670 DATA 234,96
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	3162	20	5422	30	3496
40	871	50	3133	60	1943
70	2291	80	3689	90	1345
100	4965	110	3901	120	11715
130	10115	140	1745	150	5348
160	7184	170	1623	180	5925
190	1737	200	3417	210	2381
220	6268	230	6183	240	2300
250	5248	260	5812	270	3431
280	8647	290	6495	300	3554
310	1980	320	3950	330	6241
340	4775	350	6741	360	6735
370	6729	380	8687	390	1347
400	1618	410	3912	420	8105
430	2889	440	3410	450	3415
460	3709	470	3559	480	3565
490	3762	500	6204	510	3940
520	3947	530	4138	540	4141
550	2605	560	3241	570	1345
580	11322	590	1498	600	3718
610	1943	620	6320	630	1963
640	5659	650	1745	660	4292
670	2281	680	6488	690	3601
700	10923	710	4247	720	3378
730	6488	740	3601	750	3362
760	4253	770	3456	780	3092
790	3912	800	21275	810	8054
820	10087	830	6390	840	4688

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
850	1395	860	2854	870	18183
880	18179	890	2170	900	7488
910	5324	920	20624	930	1797
940	7198	950	6824	960	6631
970	6798	980	6750	990	7008
1000	3353	1010	4350	1020	1643
1030	5520	1040	3247	1050	18797
1060	5949	1070	5941	1080	7777
1090	9689	1100	6802	1110	1498
1120	4054	1130	2894	1140	4650
1150	5219	1160	9628	1170	1355
1180	6477	1190	5980	1200	1498
1210	4294	1220	7760	1230	2110
1240	1498	1250	2888	1260	7083
1270	7083	1280	4658	1290	7092
1300	4672	1310	1498	1320	2019
1330	2893	1340	8049	1350	1498
1360	1872	1370	2894	1380	1937
1390	9919	1400	8773	1410	1355
1420	1498	1430	1873	1440	2894
1450	1942	1460	10447	1470	9418
1480	1355	1490	1498	1500	1874
1510	2894	1520	1937	1530	10435
1540	9556	1550	3174	1570	2894
1580	5337	1590	9545	1600	1355
1610	1498	1620	4020	1630	10600
1640	11175	1650	10791	1660	10785
1670	1902				

SOFTWARE Solutions

Your programming problems solved by ANDRE WILLEY

Driven Skate Crazy

I WISH to complain about the game Skate Crazy that you published in the April 1987 issue of Atari User. *I typed it in exactly as it was printed, but when I ran it the title screen appeared, followed by an error message for line 2140. I checked this line and it was just as you had printed it in the magazine.*

I took this line out of the program and ran it again. This time the error message was for line 3570, so I took this line out as well. When I ran the program again the title screen appeared with no error message. I thought I had corrected it but nothing else happened.

There is nothing wrong with my computer so is there something wrong with your program? Also, how do you use the Get It Right! table mentioned in the text? – **Victoria Crisp, Braintree, Essex.**

● The listings that we print are taken directly from working copies of the programs, so we know that they are correct.

So why didn't this one work? Well, you don't really go into enough detail in your letter about what *type* of error occurred, but I'd hazard a guess that it was most likely an error number 6 or number 8.

These relate to the READ statement which occurs in both of the lines you had trouble with, and you will probably find that the problem is with the DATA lines associated with the READ on line 2140.

If you take a look at the listing you will see that lines 1050 and 1060 read their numeric data from lines 1000 and 1020. Since these are both okay, the problem must be with the data which follows on lines 2000 to 2127.

This should be input via the READ command on 2140, so any typing mistakes will only show up when line 2140 is reached. Thus, when you deleted 2140, the error then occurred with the next READ statement (on line 3570).

Since there is a lot more data later in the program it is unlikely that an error 6 (DATA exhausted) has occurred, so the error type you are encountering is more than likely an eight – telling you that the program expected a numeric value but found something else, such as a letter or punctuation mark.

Check through lines 2000 to 2127 to make sure that all of the numbers are correct, and that you haven't mistyped or missed out a digit, or typed a full stop instead of a comma. Any of these could cause the sort of error you describe.

You should never try to correct a program by simply removing an offending line. This is partly because the programmer has obviously put each line in for a specific purpose, but also because (as we have seen) the error is very often caused by a mistake on a completely different line.

The Get It Right! table is one sure way to check that you haven't made any typing mistakes. Details of how to use it were printed in the August 1986 issue of *Atari User.*

Are you having problems getting your programs to work? Write to Software Solutions, Atari User, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

We will answer as many as we can within the pages of *Atari User* but, unfortunately we cannot give personal replies.

Joystick action

I OWN an Atari 800XL and a 1010 data recorder, and I find your magazine action-packed and crammed with great reviews of games. I am interested in programming but have a problem with inputting joystick movements.

Could you give me an example to show me how to move using the joystick and the fire button? – **P. Dayment, Basildon, Essex.**

● There are two commands you need to know – STICK and STRIG. The first tells you which direction the joystick is pointing, and the second tells you whether the button is pressed.

Each command is followed by a single number in brackets, normally a zero or a one, and this specifies which joystick socket you want to use. Thus STICK(0) would return the position of the first joystick, and STRIG(1) would tell you if the button on the second joystick has been pressed. STRIG gives a result of zero whenever the button is pressed, and a one at any other time.

The numbers returned by STICK are as follows:

```
       14
   10  |  6
     \ | /
  11 — 15 — 17
     / | \
    9  |  5
       13
```

The following short program demonstrates how to move an object (in this case an asterisk) around the screen:

```
10 GRAPHICS 0:POKE 752,1:?
20 X=10:Y=10:REM SET START POINT
30 COLOR 42:PLOT X,Y:REM PLOT POINT
40 IF STRIG(0)=1 OR STICK(0)=15 THEN 4
0:REM GO ROUND LOOP IF NO MOVEMENT
50 COLOR 32:PLOT X,Y:REM ERASE POINT
60 IF STICK(0)=14 THEN Y=Y-1:REM UP
70 IF STICK(0)=13 THEN Y=Y+1:REM DOWN
80 IF STICK(0)=11 THEN X=X-1:REM LEFT
90 IF STICK(0)=7 THEN X=X+1:REM RIGHT
100 IF X>39 THEN X=0:REM RIGHT EDGE?
110 IF X<0 THEN X=39:REM LEFT EDGE?
120 IF Y>23 THEN Y=0:REM BOTTOM EDGE?
130 IF Y<0 THEN Y=23:REM TOP EDGE?
140 COLOR 42:PLOT X,Y:REM PLOT NEW DOT
150 FOR I=1 TO 25:NEXT I:REM PAUSE
160 GOTO 40:REM GO BACK AGAIN
```

Most joystick routines will be similar to this one, but you might like to use it in conjunction with our recent series on Player Missile Graphics to get some great effects.

Lurking Horro is just that..

by Ruoloc

TALK about exhausted – there I was, minding my own business when these five Nazguls came into the local inn and started pushing and shoving people around. Well, not one to be slow in getting into a good fight, I brought out my trusty sword and laid into them.

The actual fight lasted no more than a few minutes – well I do have rather a lot of experience in these matters – but the real reason for my tiredness was because of all the free drinks that the landlord gave me. He was so grateful for my assistance that we celebrated all night.

In fact I have just got back to my cave in time for the postbag and this month's column, so without much more ado let's see what's new in the world of adventure.

The first bit of good news I have for you is that there is a new Infocom adventure about to be released called The Lurking Horro and it's full of ghastly surprises and unspeakable fear.

Any horror fans who haven't quivered to the chilling classics of Steven King and H.P.Lovecraft or shrieked at the frightening images in The Shining and The Exorcist cannot call themselves horror fans. Now you can experience what horror is really like with Infocoms's change from witty spoofs to interactive nightmare.

As the main character in the story, you have enrolled at the George Edwards Institute of Technology, and have heard nothing else except the stories about the old campus basements and storage rooms, some so ancient that they contain only rotting piles of unidentifiable junk.

You have heard about the decrepit underground tunnels crumbling into hazardous piles of concrete, and have vowed never to set foot in any of them. You do, of course, one night with a blizzard raging and the wind howling, when a strange force draws you into the dark nether regions of the institute. Then an eerie sound grows closer...Stop, enough of this. I'm starting to get edgy myself.

Suffice it to say that the adventure has been written by Dave (Zork, Spellbreaker, Suspect, and Starcross) Lebling and all the usual bits and pieces are in the package. Make sure you read *Atari User* for a full review in the future.

The second bit of good news this month is that there is another new Infocom release imminent, and this one is called Stationfall. Yes, it is a sequel to Planetfall: After three years and countless requests, author Steve Meretszky has brought back that lovable robot Floyd in an adventure which puts the fate of the whole Galaxy in your hands as you are enlisted in the Stellar Patrol.

Your heroics in Planetfall earned you a promotion from Ensign Seventh Class to Lieutenant First Class in the very boring paperwork task force.

Life is just very tedious, and to cap it all you are assigned to travel to a nearby space station to pick up some forms. Imagine your surprise when you discover that your companion for the journey is the mischievious and playful Floyd.

When you both arrive at the station, all is not well. The place is deserted save for an ostrich, a balloon creature and a brainy robot named Plato. Something is very wrong... but what?

This game is a worthy sequel to Planetfall, and Steve's humour, so apparent in Hitchhikers and Leather Goddesses, is well in evidence here. So watch out for another review.

I hope you like the map of Alternate Reality, on the next two pages (going around that place almost drove me bonkers, but anything to help fellow adventurers) and I look forward to our meeting next issue, when all that is interesting in the world of adventuring will be served to you on a silver platter.

See you next month





LEE from Walsall has bought Ultima IV and needs some guidance on how to find The Stones and how to get followers to join him. Ultima and my good friend Lord British have given us a tough nut to crack as the playing area is vast, so don't expect me to give the whole game away – it would take up too much space anyway.

Instead I will reveal to you where each rune can be found. Honesty is in Moonglow, Compassion is in Britain (in the Inn), and Valor can be found at Towne. Justice is hidden at Yew, Sacrifice is in the fire pit in Minoc, Honor south west of Trinsic, Spirituality is in Lord British's castle and Humility is in the village of Paws. Write back and tell me how you get on.

Nathan from Sheffield is having problems with Colossal Adventure and wants to know how to get the Platinum Pyramid out of the Plover room and where to find the pirate's treasure chest.

The crack in the Plover room is so small that only if you drop everything can you squeeze in. Once inside, just say PLOVER and you will appear at the Y2 rock room. Then say PLOVER again and you return and so forth.

The pirate skulks in the main maze and his chest is hidden deep inside it. You can actually get to it in four moves from a certain spot, but I am not going to spoil the fun for you.

Calvin from Nottingaham has a problem answering Graunch's riddles in Return To Eden. He doesn't know how to type the answers. Well, just type the actual SOLUTIONS Calvin. And don't mess about with "The answers are" , just type in the answer.

Ken White is having trouble with Balyhoo, he can't use the ticket to visit the sideshows: Also, he can't get THROCK to work in SPELLBREAKER.

The ticket is used by inserting it in the turnstile, if you examine it you will find a slot. THROCK is used by planting the weed in front of the Ogre and envoking the said spell, which will aggravate his condition long enough for you to get past.

Phil Hardy cannot get out of the City in Lapis Philosophorum, even though he has the amulet after returning the cat to the old lady.

The answer is to dangle the amulet in front of the guards' eyes: They will be hypnotised, and forget their orders not to let anyone out. ■

Drive into danger



IMAGINE a world where the only form of employment is driving an armour-plated car, full up to the brim with weaponry, along hostile roadways, fighting any other driver on the road in order to deliver cargo from one city to another.

Then, for sport and relaxation, do battle in a city's arena, pitting your car, driving skills and life against others for a prize of fame and wealth.

This is the world of Autoduel, a role playing adventure game in the Dungeons and Dragons vein but with a futuristic bent to it.

You begin with $200 and just your legs for transport – which in Autoduel is decidedly unhealthy – so you need to get cash quickly to buy your first car and then begin your duelling career.

New recruits start in the arena on Amateur Night, where you are given a car to use on the track against five other hopefuls. If you win you get $1500 and can start buying new equipment to add to your car.

As in all role playing games, your character develops as you progress in the game, and as you reach each new city the chances of getting more exciting jobs increase.

In each city there are a number of locations to visit where you listen for rumours, get repairs or buy new weapons. You can even sell off salvage from your on the road duelling and best of all is to become an FBI marshall and clear all the outlaws from the highways.

The game is based on Steve Jackson's board game Car Wars and Origin has used the Ultima team to convert it into a computer project. The packaging impressed me: You get a detailed manual, a full colour road map and even a mini pack of real tools.

The only flat tire in the game was its black and white display, which does not do much for the old Atari colour capabilities.

Still if you like playing role playing games this is the one for you.

Program: Autoduel
Price: £19.95 .
Supplier: Origin Systems, c/o Microprose, 2 Market Place, Tetbury, Gloucestershire, GL8 8DA.
Tel: 0666 54326

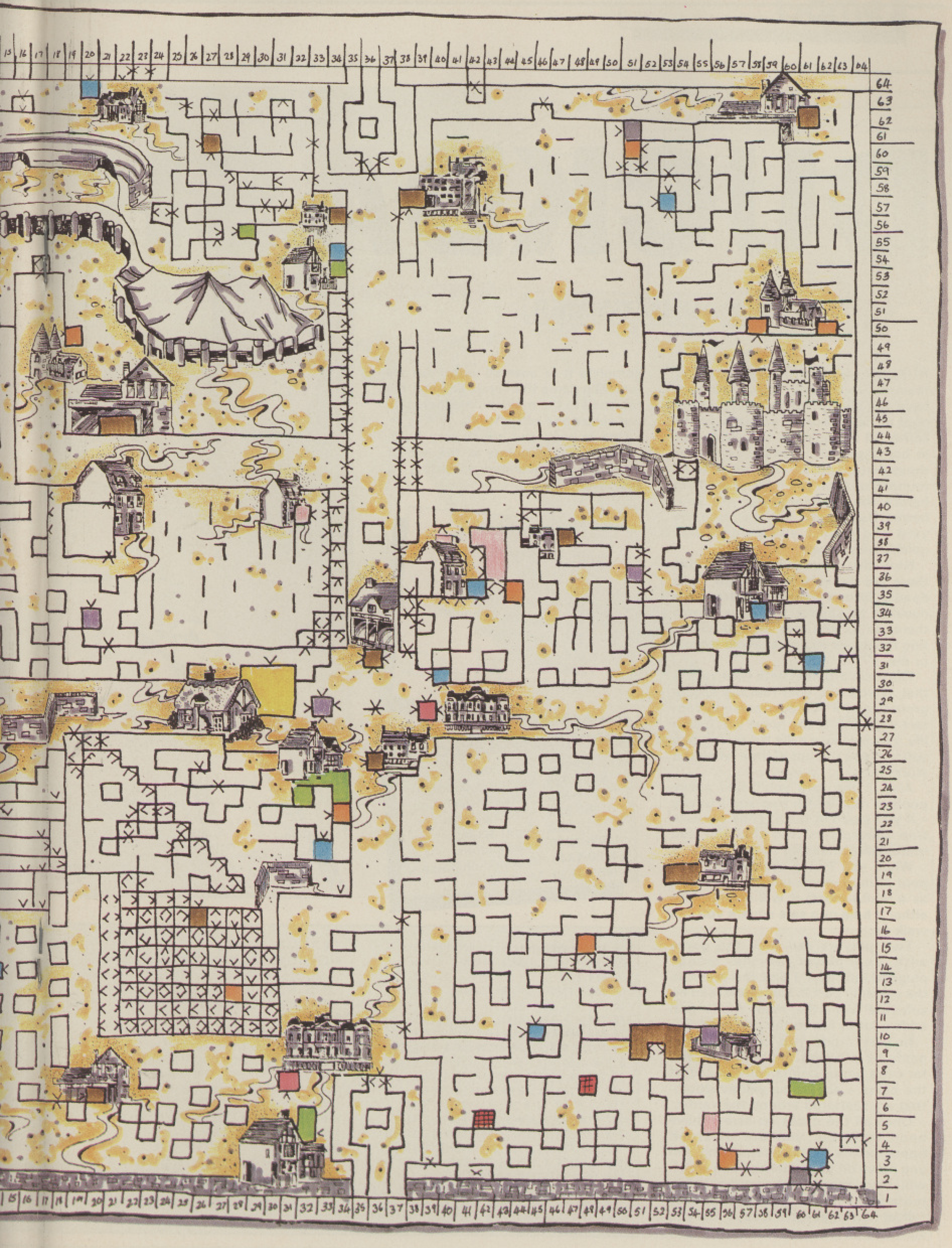
alternate REALITY

The City

- SH Shop
- T - Tavern
- G - Guild
- S - Smithy
- H - Healers
- I - Inns
- B - Bank
- D - Dungeon entrance
- C - Closed by order of the palace: such as House of ill repute
- - Traps: One entrance, no exit
- W - Wilderness entrance
- - Direction of access through wall or door (sometimes invisible)
- - Two directional access
- - Entrance (in this instance to a shop)

Access to dungeon, palace, arena, or wilderness from the city is only possible when the relevant part of the series is available.





DUCKDASH

BY JOHN GYMER



HURRICANE Harriet is heading towards your farm. Heavy showers have already turned your yard into a pool of mud and the worst is yet to come. All the animals have been put in barns and old sheds – except for those dratted ducks, who refuse to be rounded up. And you haven't got long before the hurricane hits. So you, farmer Dash, must hurry around the yard and collect all the ducks as quickly as you can.

Now this sounds very easy but there are dangers in the yard. Two deadly farmer-eating spiders have decided to shelter from the storm there, so as you race around collecting the ducks you must avoid them – or die.

The main problem with your yard is that as you run, your feet dig up the ground, and if you ever come in contact with one of the holes you lose a life. You also lose a life if a spider eats you or if you run out of time when the storm hits.

Also in the yard you'll find sticky pools of mud which trap you – briefly – if you stand in them. They can also trap the spiders and this can add more gamesmanship to play.

When you finally escape from the pool of mud which (shows on-screen as a white cross) it will change into either a hole or a safe square you can walk on.

Two players can play the game with one player as the farmer plugged into port 1 and the other as the spider in port 2. This option can be selected from the main menu and adds a lot of fun to the program.

In play mode you can abort the game by pressing the start key, and for extra bonus points you can collect the coins – shown as yellow dots – that are scattered around the yard.

Once all the ducks on screen have been collected you are awarded bonus points for time remaining and you move on to the next screen which will have more ducks, more coins, more sticky pools and faster spiders.

If at any time you lose a life you continue on the same screen until you complete it or until all your lives are lost. The game then ends and you are returned to the main menu where you can select one of six levels.

One is easy and six is very hard, with the bonus points at the end of each screen calculated according to skill level selected.

VARIABLES

HISC	High score.
SC	Score.
SK	Skill.
X, X1, X2	Position of farmer.
Y, Y1, Y2	Position of spider.
LEV	Screen/level.
LIV	Lives.
TIME	Time left.
MEM	Address of character set.

PROGRAM BREAKDOWN

90-660	Main loop.
90-190	Farmer movement.
200-390	Spider movement.
450-580	Sound effects.
710-920	Menu screen.
960-1270	Initialisation.
1280-1440	Redefine characters.
1450-1520	Music data.

```
10 REM ******************************
20 REM *         DUCK  DASH         *
30 REM *                            *
40 REM *       by John Gymer        *
50 REM *                            *
60 REM *         Atari User         *
70 REM ******************************
80 GOSUB 960:HISC=0:SC=0:SK=1:PL=0:GOT
0 710
90 REM ** FARMER MOVE **
100 S=STICK(0):IF S=15 THEN 200
110 IF ST>0 THEN ST=ST-1:GOTO 200
120 ST=0:POSITION X,Y:? #6;" ";:X3=X:Y
3=Y:X=X+(S=7)-(S=11):Y=Y+(S=13)-(S=14)
130 LOCATE X,Y,A:IF A=119 THEN X=X3:Y=
Y3:POSITION X,Y:? #6;"y";:GOTO 200
140 IF A=213 THEN ST=15
150 IF A=118 THEN SC=SC+10:GOSUB 520
160 IF A=90 THEN SC=SC+2:DU=DU-1:GOSUB
 480:IF DU=0 THEN GOTO 670
170 IF A=32 OR A=216 THEN GOSUB 460:LI
V=LIV-1:IF LIV=0 THEN GOSUB 540:GOTO 7
10
180 IF A=216 THEN GOTO 980
190 POSITION X,Y:? #6;"y";:POKE 53279,
0
200 REM ** SPIDER MOVES **
210 REM SPIDER 1
220 IF ST1>0 THEN ST1=ST1-1:GOTO 310
230 X3=X1:Y3=Y1:POSITION X1,Y1:? #6;"w
";:IF PL=0 THEN GOSUB 590:X1=X1+(S=0)-
(S=1):Y1=Y1+(S=2)-(S=3)
240 IF PL=1 THEN S=STICK(1):X1=X1+(S=7
)-(S=11):Y1=Y1+(S=13)-(S=14)
250 LOCATE X1,Y1,A:IF A=119 THEN X1=X3
:Y1=Y3:POSITION X1,Y1:? #6;"X";:GOTO 3
10
260 IF A=213 THEN ST1=15
270 IF A=118 OR A=90 OR A=216 OR A=32
THEN X1=X3:Y1=Y3:POSITION X1,Y1:? #6;"
```



```
X";:GOTO 310
280 IF A=121 THEN GOSUB 460:LIV=LIV-1:
IF LIV=0 THEN GOSUB 540:GOTO 710
290 IF A=121 THEN GOTO 980
300 POSITION X1,Y1:? #6;"X";
310 REM SPIDER 2
320 IF ST2>0 THEN ST2=ST2-1:GOTO 400
330 X3=X2:Y3=Y2:GOSUB 590:X2=X2+(S=0)-
(S=1):Y2=Y2+(S=2)-(S=3):POSITION X3,Y3
:? #6;"W";
340 LOCATE X2,Y2,A:IF A=119 THEN X2=X3
:Y2=Y3:POSITION X1,Y1:? #6;"X";:GOTO 4
00
350 IF A=213 THEN ST2=15
360 IF A=118 OR A=90 OR A=216 OR A=32
THEN X2=X3:Y2=Y3:POSITION X2,Y2:? #6;"
X";:GOTO 400
370 IF A=121 THEN GOSUB 460:LIV=LIV-1:
IF LIV=0 THEN GOSUB 540:GOTO 710
380 IF A=121 THEN GOTO 980
390 POSITION X2,Y2:? #6;"X";
400 REM ** EXTRA CHECKS ETC... **
410 POSITION 6,0:? #6;SC;:POSITION 16,
0:? #6;INT(TIME/4);" ";:POSITION 4,1:?
 #6;LIV;" ";:POSITION 18,1
420 ? #6;LEV;" ";:TIME=TIME-1:IF TIME<
0 THEN LIV=LIV-1:GOSUB 460:IF LIV=0 TH
EN GOSUB 540:GOTO 710
430 IF PEEK(53279)=6 THEN GOTO 710
440 GOTO 90
450 REM ** SOUND EFFECTS **
460 REM LOSE A LIFE
470 FOR N=0 TO 5:FOR X3=155 TO 255 STE
P 7:SOUND 0,X3,10,8:NEXT X3:NEXT N:SOU
ND 0,0,0,0:RETURN
480 REM COLLECT DUCK
490 A=255:X3=2
500 SOUND 0,A,12,12:A=A-X3:X3=X3*1.25:
IF A>0 THEN 500
510 SOUND 0,0,0,0:RETURN
520 REM COLLECT COINS
530 FOR N=15 TO 0 STEP -1:SOUND 0,20,1
0,N:NEXT N:SOUND 0,0,0,0:RETURN
540 REM LOST ALL LIVES
550 RESTORE 1500:FOR N=0 TO 200:NEXT N
560 READ A:IF A=0 THEN 580
570 READ X:FOR N=0 TO X/2:SOUND 0,A,10
,8:SOUND 1,A+1,10,8:NEXT N:SOUND 0,0,0
,0:SOUND 1,0,0,0:GOTO 560
580 FOR N=0 TO 200:NEXT N:RETURN
590 REM ** SPIDER MOVES **
600 IF INT(RND(0)*(7-SK))+1=1 THEN 620
610 S=INT(RND(0)*4):RETURN
620 IF X>X3 THEN S=0:GOTO 660
630 IF X<X3 THEN S=1:GOTO 660
640 IF Y>Y3 THEN S=2:GOTO 660
650 S=3
660 RETURN
```

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```
670 REM ** SCREEN COMPLETE **
680 FOR N=TIME TO 0 STEP -20:SC=SC+SK:
FOR A=15 TO 5 STEP -2:SOUND 0,10,10,A:
NEXT A:POSITION 16,0
690 ? #6;INT(N/4);" ";:POSITION 6,0:?
#6;SC;
700 NEXT N:POSITION 16,0:? #6;"0 ";:SO
UND 0,0,0,0:FOR N=0 TO 400:NEXT N:LEV=
LEV+1:GOTO 980
710 REM ** MENU SCREEN **
720 IF SC>HISC THEN HISC=SC
730 GRAPHICS 2+16:LEV=1:LIV=5
740 RESTORE 1470
750 READ A:IF A=0 THEN 770
760 READ X:FOR N=0 TO X/8:SOUND 0,A,10
,8:SOUND 1,A+1,10,8:NEXT N:SOUND 0,0,0
,0:SOUND 1,0,0,0:GOTO 750
770 POSITION 5,0:? #6;"DUCK DASH"
780 POSITION 3,1:? #6;"by john gymer"
790 POSITION 4,3:? #6;"FIRE to play"
800 POSITION 2,4:? #6;"OPTION for skil
l"
810 POSITION 1,5:? #6;"SELECT for play
ers"
820 POSITION 1,10:? #6;"last score was
 ":? #6;" high score is ";
830 BYTE$=STR$(SC):POSITION 19-LEN(BYT
E$),10:? #6;BYTE$:BYTE$=STR$(HISC):POS
ITION 19-LEN(BYTE$),11:? #6;BYTE$;
840 SC=0:GOTO 900
850 A=0:IF PEEK(53279)=5 THEN PL= NOT
(PL):FOR N=15 TO 0 STEP -0.5:SOUND 0,5
0,10,N:NEXT N:A=1
860 IF PEEK(53279)=3 THEN SK=SK+1:A=1:
FOR N=0 TO 15 STEP 0.5:SOUND 0,50,10,N
:NEXT N:SOUND 0,0,0,0
870 IF SK>6 THEN SK=1
880 IF STRIG(0)=0 OR STRIG(1)=0 THEN 9
80
890 IF A=0 THEN 850
900 POSITION 5,7:? #6;PL+1;" PLAYER ";
:IF PL=1 THEN POSITION 13,7:? #6;"S"
910 POSITION 3,8:? #6;"SKILL LEVEL ";S
K
920 GOTO 850
930 RESTORE 1520
940 READ A:IF A=0 THEN RETURN
950 READ X3:FOR N=0 TO X3/8:SOUND 0,A,
10,8:SOUND 1,A+1,10,8:NEXT N:SOUND 0,0
,0,0:SOUND 1,0,0,0:GOTO 940
960 REM ** INITIALISATION **
970 POKE 559,0:GOSUB 1280:POKE 559,34:
LEV=1:SC=0:LIV=5:RETURN
980 GRAPHICS 1+16:POKE 756,MEM:SETCOLO
R 2,0,14
990 POKE 559,0:ST=0:ST1=0:ST2=0:DU=LEV
*3:? #6;"}":FOR N=4 TO 22:POSITION 1,N
1000 ? #6;"wwwwwwwwwwwwwwwwww":NEXT N:
REM 18 'w' IN LINE
1010 POSITION 0,3:? #6;"wwwwwwwwwwwwww
wwwwww";:POSITION 0,23:? #6;"wwwwwwwww
wwwwwwwwwww";:REM 20 'w' IN EACH
1020 FOR N=4 TO 22:POSITION 0,N:? #6;"
w";:POSITION 19,N:? #6;"w";:NEXT N
1030 POSITION 0,0:? #6;"SCORE      TIM
E     ";:POSITION 0,1:? #6;"MEN
 SCREEN   ";
1040 TIME=(LEV*3)*(75-LEV)
1050 REM PLOT DUCKS
1060 FOR N=1 TO LEV*3
1070 X=INT(RND(0)*18)+1:Y=INT(RND(0)*1
9)+4:LOCATE X,Y,A:IF A<>247 OR (X=9 AN
D Y=13) THEN 1070
1080 POSITION X,Y:? #6;"Z";:NEXT N
1090 REM PLOT OBJECTS
1100 FOR N=1 TO LEV*5
1110 X=INT(RND(0)*18)+1:Y=INT(RND(0)*1
9)+4:LOCATE X,Y,A:IF A<>247 OR (X=9 AN
D Y=13) THEN 1110
1120 POSITION X,Y:? #6;" ";:NEXT N
1130 REM PLOT SPIDERS
1140 FOR N=1 TO 2
1150 X=INT(RND(0)*18)+1:Y=INT(RND(0)*1
9)+4:LOCATE X,Y,A:IF A<>247 OR (X=9 AN
D Y=13) THEN 1150
1160 IF N=1 THEN X1=X:Y1=Y:GOTO 1180
1170 X2=X:Y2=Y
1180 POSITION X,Y:? #6;"X";:NEXT N
1190 REM PLOT COINS
1200 FOR N=1 TO LEV*0.5
1210 X=INT(RND(0)*18)+1:Y=INT(RND(0)*1
9)+4:LOCATE X,Y,A:IF A<>247 OR (X=9 AN
D Y=13) THEN 1210
1220 POSITION X,Y:? #6;"v";:NEXT N
1230 REM PLOT STICKY SQUARES
1240 FOR N=1 TO LEV*5
1250 X=INT(RND(0)*18)+1:Y=INT(RND(0)*1
9)+4:LOCATE X,Y,A:IF A<>247 OR (X=9 AN
D Y=13) THEN 1250
1260 POSITION X,Y:? #6;"U";:NEXT N
1270 X=9:Y=13:POSITION X,Y:? #6;"y";:P
OKE 559,34:GOSUB 930:GOTO 90
1280 REM **** DEFINE CHARACTERS ****
1290 DIM BYTE$(80):RESTORE 1320
1300 MEM=PEEK(106)-4:POKE 106,MEM-4:CH
ACT=MEM*256:GRAPHICS 1+16
1310 FOR LOOP=1 TO 32:READ PGM:BYTE$(L
OOP,LOOP)=CHR$(PGM):NEXT LOOP
1320 DATA 104,104,133,213,104,133,212,
104,133,215,104,133,214,162,4,160,0,17
7,212,145,214
1330 DATA 200,208,249,230,213,230,215,
202,208,240,96
1340 Z=USR(ADR(BYTE$),224*256,CHACT)
1350 RESTORE 1380:FOR CHAR=53 TO 58
1360 POS=CHACT+(CHAR*8):FOR X=0 TO 7:R
EAD A:POKE (POS+X),A:NEXT X
1370 NEXT CHAR
```

This is one of hundreds of programs now available FREE for downloading on **MicroLink**

```
1380 DATA 0,254,198,170,146,170,198,25
4
1390 DATA 0,16,56,16,68,238,68,0
1400 DATA 0,254,254,254,254,254,254,25
4
1410 DATA 60,90,126,60,231,165,165,129
1420 DATA 0,24,60,255,255,60,24,0
1430 DATA 48,209,49,63,63,30,8,24
1440 POKE 756,MEM:RETURN
1450 REM ** MUSIC DATA **
1460 REM TUNE 1
1470 DATA 121,50,96,50,96,25,108,50,12
1,50,91,50,121,50,91,100,121,50,91,50,
91,25,96,50,121,50,91,50
1480 DATA 121,50,182,100,0
1490 REM TUNE 2
1500 DATA 121,75,121,25,102,50,108,50,
121,50,128,50,121,100,0
1510 REM TUNE 3
1520 DATA 121,60,121,30,96,65,121,50,8
1,60,81,60,121,100,0
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
80	7943	90	3684	100	4702
110	5673	120	13222	130	13171
140	3315	150	5598	160	11256
170	14187	180	3702	190	6364
200	4155	210	2243	220	5668
230	18708	240	11203	250	14416
260	3360	270	15799	280	11960
290	3683	300	4880	310	2246
320	5674	330	15004	340	14428
350	3363	360	15807	370	11960
380	3683	390	4887	400	5373
410	18165	420	17725	430	5334
440	1432	450	4284	460	2858
470	16580	480	3218	490	1802
500	8884	510	3975	520	3445
530	11818	540	3587	550	6576
560	3894	570	17397	580	5714
590	4155	600	6118	610	4522
620	4764	630	4764	640	4775
650	585	660	1498	670	4639
680	16998	690	6986	700	15714
710	3782	720	4832	730	4872
740	2284	750	3894	760	17409
770	5371	780	7209	790	10560
800	13823	810	15017	820	13265
830	20415	840	2533	850	16007
860	16804	870	3171	880	6348
890	2648	900	12817	910	6773
920	1637	930	2275	940	4949
950	18027	960	4719	970	10979
980	7800	990	13865	1000	19782
1010	25508	1020	12512	1030	14023
1040	3895	1050	2990	1060	3013
1070	15614	1080	5697	1090	3130
1100	3017	1110	15598	1120	5639
1130	3163	1140	2085	1150	15610
1160	5810	1170	2117	1180	5823
1190	3007	1200	3357	1210	15600
1220	5725	1230	4868	1240	3017
1250	15612	1260	5820	1270	11524
1280	5438	1290	4670	1300	10767
1310	12298	1320	12677	1330	7166
1340	5932	1350	5599	1360	11546
1370	2219	1380	5529	1390	4285
1400	5496	1410	5280	1420	4415
1430	4498	1440	4141	1450	3532
1460	1844	1470	14321	1480	3334
1490	1845	1500	8435	1510	1846
1520	8034				

Reading the paper

ERNIE LITTLE eases the task of wallpapering

WHEN buying your micro, did you ever think: "It'll even help with the housework"? And have since spent many hours trying to justify that very statement?

In response to all those letters we get pleading for more domestic utilities, we've come up with a program to help you calculate how many rolls of wallpaper you will need when you decorate a room.

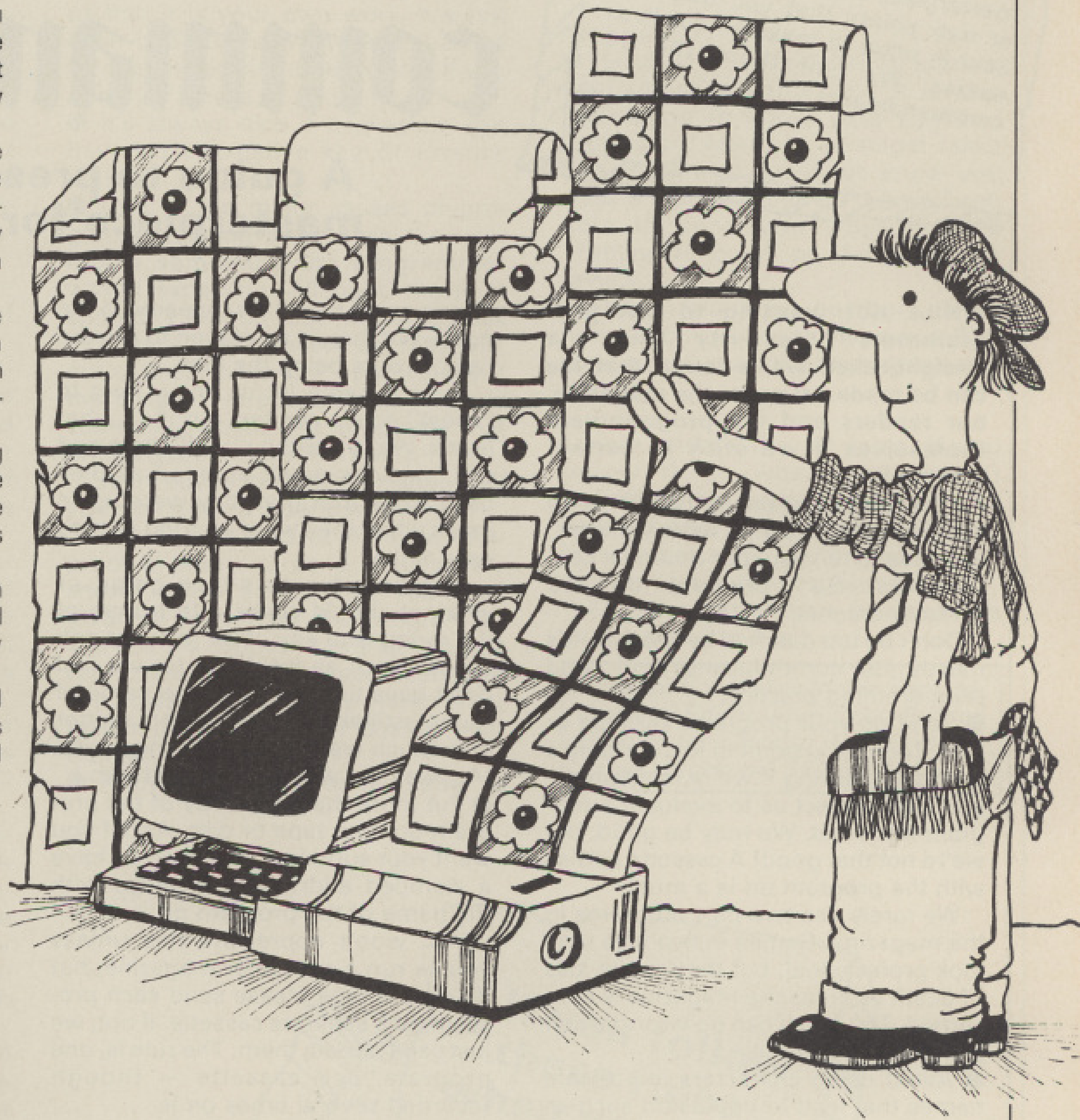
When the program is run you are requested to input the size of the room that you wish to decorate, both in length and height – these measurements should be in metres.

The height is between the skirting board and the ceiling, the length of the walls is the total distance around the room, including doors and windows to allow for any wastage.

You will now be asked for the length of the roll of wallpaper. Most rolls sold these days are precut to 10m by 520mm so you will usually enter 10.

The total number of rolls to buy will now be printed. The total to buy is derived from rounding up the total number of rolls calculated.

Please note that this is only intended as a rough guide, and doesn't take into account pattern matches.



VARIABLES

- **A** Height of walls.
- **B** Distance around room.
- **C** Length of roll.
- **R** Number of rolls needed.
- **D** Number of rolls to buy.

```
10 GRAPHICS 1+16:POSITION 0,6:? #6;"Wa
LlPaPeR cAlCuLaToR":POSITION 9,10:? #6
;"bY"
20 POSITION 4,14:? #6;"eRnIe LiTtLe"
30 FOR DE=1 TO 1000:NEXT DE
100 GRAPHICS 0:SETCOLOR 2,0,0:POKE 752
,1
110 POSITION 10,1:? "WALLPAPER CALCULA
TOR"
120 FOR A=10 TO 29:POSITION A,2:? CHR$
(13);:NEXT A
130 POSITION 2,5:? "ENTER HEIGHT OF RO
OM IN METRES.      ":POSITION 33,5:INPU
T A
135 IF A<0 THEN 130
140 POSITION 2,8:? "ENTER LENGTH OF RO
OM IN METRES.      ":POSITION 33,8:INPU
T B
145 IF B<0 THEN 140
150 POSITION 2,11:? "ENTER LENGTH OF R
OLL IN METRES.      ":POSITION 33,11:IN
PUT C
155 IF C<0 THEN 150
160 R=(B/0.52)/(C/A)
170 IF R>INT(R) THEN LET D=INT((R)+1)
180 FOR A=2 TO 37:POSITION A,15:? CHR$
(160);:NEXT A:FOR A=2 TO 37:POSITION A
,19:? CHR$(160);:NEXT A
190 FOR A=15 TO 19:POSITION 2,A:? CHR$
(160);:NEXT A:FOR A=15 TO 19:POSITION
37,A:? CHR$(160);:NEXT A
200 POSITION 5,17:? "YOU NEED TO PURCH
ASE ";:? D;:? " ROLLS"
215 FOR DE=1 TO 500:NEXT DE
220 POSITION 5,17:? "YOU NEED TO PURCH
ASE ";:? D;:? " ROLLS"
225 FOR DE=1 TO 500:NEXT DE
230 GOTO 200
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	15636	20	6820	30	4360
100	6952	110	7498	120	8342
130	14300	135	2609	140	14328
145	2619	150	14452	155	2629
160	2517	170	6165	180	17326
190	17500	200	10329	215	4174
220	20569	225	4174	230	1610

WE already know how skilled and creative Atari users are, and we look forward to receiving your programs and articles for publication in future issues of *Atari User*. However, before you send your masterpiece off to us there are one or two points that you ought to bear in mind to make all our lives easier. We call them the 18 commandments...

The 18 commandments

A guide to presenting your masterpiece for publication

WHILE not wanting to put programmers creativity into a straightjacket, we've found that life can be made easier for the magazine, our readers and the programmers themselves if we stick to certain standards.

It has also occurred to us that it's no good our just knowing what we want: We have to tell you, our potential contributors. So here are our 18 commandments.

Don't be too daunted by the list – it's mostly just commonsense and good programming practice.

● Send us your programs on tape or disc. There's no point in just sending a listing and asking if we're interested – you can't expect us to evaluate a program from that. We may be good, but we're not that good! A cassette or disc with the program on is a must.

We rarely use two-part programs in the magazine. Games in two files may look professional, but they're the kiss of death as far as the magazine is concerned. Too much can go wrong when people type them in.

● Avoid using characters in variable names that lead to confusion such as as *1* and *l*, *0* and *O*. Meaningful variable names help as well – *ALIENS* is far more understandable than *AL*.

● Tell us what the program is supposed to do and refer to it by name. You'd be amazed at the number of programs we get where the author forgets to tell us what it is all about.

In any subsequent correspondence, reference to "my program" can cause problems by it's vagueness. Okay, we'd have the program on record somewhere, but life would be a lot easier all round if its author were less modest and admitted he was the genius behind Mega-invaders.

● Label everything with the program's title and your own name and address. Keep your own copy, too. So far the only existing copy of one particular classic game hasn't disappeared in the post – but there's no reason to run the risk of yours being the first.

If it's a game let us know how to "cheat" so we can test out the higher levels. We're getting on a bit here and our reactions aren't as good as they used to be (not that they were up to much when they were as good as they used to be...)

And an adventure-type game or whatnot should come with a map of the rooms and any other relevant crib sheet. Much as we'd like to, we just don't have time to guess the name of Rumplestiltskin's brother, no matter how much we admire your ingenuity. (Anyway, he works in our artroom.)

● Put more than one copy of the program on your tape or disc. And if you want your submission back let us have a stamped addressed envelope with the name of the program on it.

You won't appreciate this unless you've run a computer magazine, but if you use tape please send each program on a separate cassette. If not, we just can't handle them. The rule is, one program per cassette – though recorded several times on it.

● Let us have a printed listing if possible. Screen dumps or off-screen photos are much appreciated, though not vital. Diagrams are always of use: Often a point that's difficult to put into words becomes clear as crystal when you sketch it out.

● Give a description of the program, what it does, why you wrote it, and outline the way it works and its variables and subroutines.

If it's a game let us have a plot. You'll get an idea of the sort of thing by reading the instructions to one or two of our games.

Maybe you could also give a few ideas for its improvement or expansion. Even if you can't get your upgrades to work, there's a good chance that one of our talented readers will.

Every subroutine must be titled clearly with a REM and should be referred to by it. Again, make the title meaningful. Also, when you GOSUB, use a REM to indicate which subroutine you're using. For example:

```
100 GOSUB 1000: REM MOVE MAN
.
.
.
1000 REM **** MOVE MAN ****
.
.
1100 RETURN
```

At first this may seem to be far too much fuss, but it's not just for the readers' benefit. As your programs grow you'll find that such REMs more than repay the effort by allowing you to keep track of your work.

When you write out your list of subroutines – which is vital – try to do it in this form:

```
 100 EXAMPLE  Shows how we want...
 200 DELAY  Holds tings up...
```

where the line numbers refer to the lines in which the subroutine is defined. Again, this helps by making things clearer to our readers – and you.

We don't expect your program descriptions to be classics of English literature, but it does help if they make sense and are easy to follow. Try reading them out loud – you'd be amazed how much such a simple technique can improve your writing.

Also, if you get stuck trying to put something into words use this trick: Tell someone what it is you're trying to put into words – then write it down. Before you reject this hint, try it - more than one professional writer owes his career to it.

● Make sure that the program actually works. Try it out on your friends for

their criticism (painful though it may be). The acid test is to ask them to type it in. And – when you find yourself muttering through clenched teeth, "How could anyone be that stupid?" (the answer is "regularly") – cast out the mote in your own eye and alter your program to take account of the feedback.

It's not easy to do, as the all-too-frequent bloodfeuds among the editorial staff here testify, but it's worth it.

Instructions can make or break a game. Make sure that yours really do instruct. They should be complete and it helps if the spelling and grammer are correct. Apart from causing confusion, such errors also make programs look amateurish.

As well as misspellings, bad grammar, split words and general untidiness are all to be avoided.

Following even the simplest program can cause problems for the most experienced programmer – don't add to them unnecessarily. One major cause of having to return programs for modifications is colour/monochrome incompatibility.

You can develop a beautiful program making use of all the splendid colour the Atari has to offer, only to find that the action disappears in an impenetrable fog on a monochrome TV – and vice-versa.

If possible, try your program on both types of television. User groups are invaluable here, as they are in all aspects of program development.

● Please do put lots of nice explanatory REMs in your programs. A couple of REM statements with nothing after them at the beginning of the program gives us room to put in our messages without messing up all the line numbers you have referred to in your program description.

● Avoid having lines with just a REM and nothing else. It may make the program look neater, but we won't welcome letters asking what the missing words are. Remember, people will be spending hours typing your programs into their micros. Make their life easier if you can.

● Double space all your written matter. This means leaving a blank line between each line of text which is vital from our point of view – try to follow our style. We have our own ways of doing things: For example, we press the Return key, not the RETURN key as you might expect.

Just look how we do it in the magazine. Our programs are Program I, Program II and so on, our diagrams Figure I, Figure II.

● If you must use long multiple lines don't go over 114 characters by using abbreviations for commands as people then complain the lines are too long.

● Don't use abbreviations in text. They're exceptionally easy to miss – for the sake of typing two extra characters you can save our readers hours of frustration.

● Please, when you send us your work, include a separate page telling us that it is your own work, has not been offered elsewhere and that we have your permission to print it. If you don't we'll have to return it.

● It's always nice if a program can have an alternative key or joystick option.

● One of the major causes of programs crashing is because the user inputs something the programmer wasn't expecting. All right, the idiot shouldn't type in -999 when you ask him his age, but believe us, they will, out of sheer peversity – particularly if the program is educational. There is something about CAL programs that brings out the devil in us all...

So try out all the unlikely options – if you don't, some poor user will.

Actually, it takes a lot of skill to idiot-proof a program, as it is delicately known in the trade. Often you're so involved in getting the program to work as it's supposed to that you just can't make the mental leap needed to see it as the passively malevolent reader does – so try it out on your friends.

● Another irritation for a reader is when he sees something like:

```
PRINT"    "
```

Exactly how many blanks is he supposed to enter?

Use:

```
PRINT"    ":REM n SPACES
```

for *n* spaces.

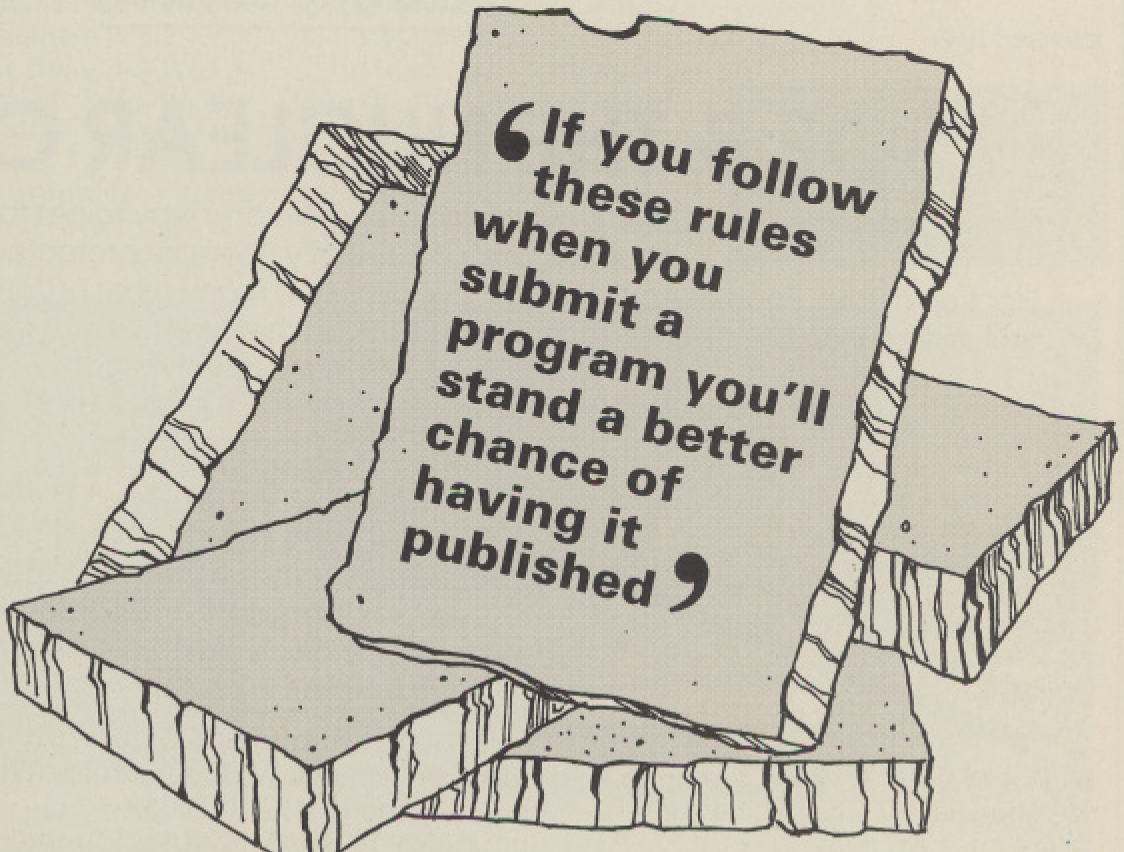
● Tell us who you are. We like to know your Christian name, and it is also interesting to know your age and profession. After all, we might reject your program, but if we knew you were a fetlock fettler we'd have been able to send you Obscuresoft's "Fettling fetlocks" on the 130XL for review.

Also a telephone number – both home and work – with the correct STD code is really useful, and can save a lot of time.

Here endeth the 18 rules. If you follow these when you submit something to us you'll stand a much better chance of having it published. More importantly, you'll become a far more professional programmer.

And the better you become the more satisfying it is.

Contributions should be sent to: Features Editor, Atari User, *Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.*



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Shivers down the spine

Program: Phantom
Price: £7.95 (cassette), £9.95 (disc)
Supplier: Tynesoft, Addison Industrial Estate, Blaydon, Tyne and Wear, NE21 4TE.
Tel: 091-414 4611

STRANGE things are happening – unexplainable and creepy occurrences. So when I picked up my copy of Tynesoft's latest game Phantom, shivers ran down my spine.

You are a professor of astro-physics who happens to be interested in psychic phenomena and built a portable nuclear accelerator, presumably in his garage. Now this reactor makes a large hole in spooky phantoms.

So with reactor in hand you are well prepared for the horrors that face you, or are you?

On loading I was greeted by the control panel featuring score, reactor level, heart rate (in beats per minute) and an electrocardiograph (ECG), which resides on the bottom right of the screen.

Now it appears that you only have one life and the BPM indicator increases every time a ghost comes into contact with you – once this reaches 100 your old ticker will give out.

You arrive at Ye Olde Inn, and are met with a plan view that looks more like a maze. Scurrying around are ghosts, who as soon as they see you, begin to converge.

Easy, I hear you say, out with the nuclear accelerator and poof, the spooks begin to vanish in clouds of ectoplasm. This is a pretty neat weapon as it wipes out several spooks in one blast.

But there is one problem – you only have a limited supply of isotope in your reactor and if you empty it you are in deep trouble.

New ones are scattered about the inn, but as discretion is the better part of valour, you can dodge the spooks instead.

You have to battle your way round four screen levels of the inn, collecting keys and other items on your way.

You eventually battle with a large and very nasty ghost. At this point I realised that my heart rate did not go down in the move from one level to the next. Indeed it only settled when I completed the Inn and moved on to the Dungeon where a completely different set of nasties decided to have me for breakfast.

With 64 different rooms and the mansion and castle to exorcise there is plenty to keep you on your toes – especially as the difficulty and quality of mazes increase.

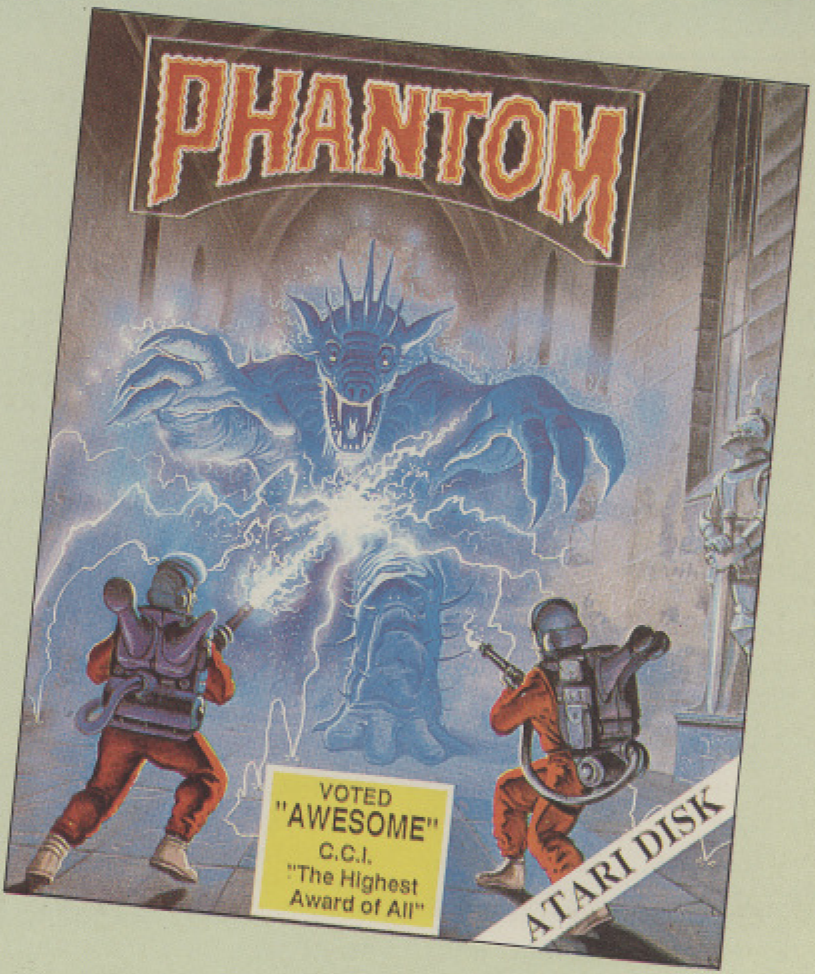
The graphics used throughout are first-rate coupled with a wonderful background tune. Character animation is superb both for spooks and your player character.

My only quibble is that the spooks can get you without you being able to shoot them. This is not a major problem because if you are good enough you simply sidestep them.

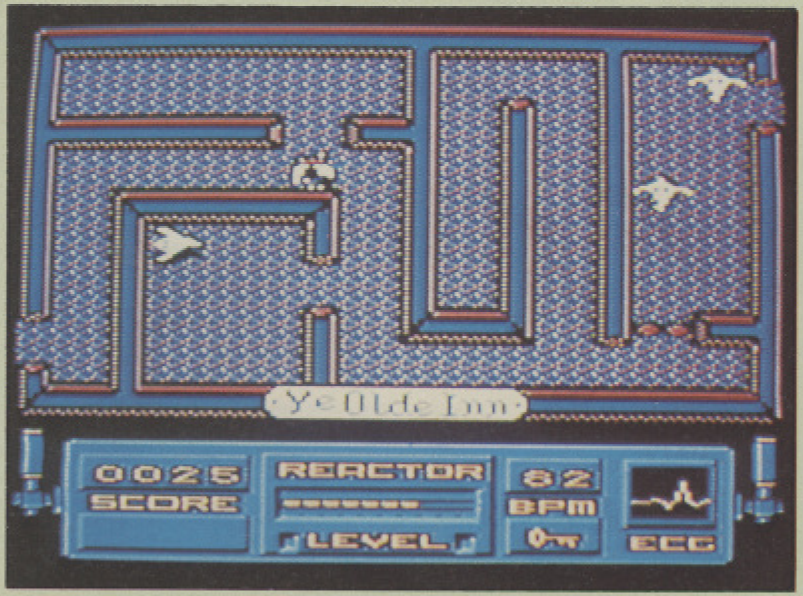
Instead of rampaging around the screen hacking and slashing your enemy, with Phantom you must use tactics to negotiate each screen. This evasive angle adds a very addictive quality to the game.

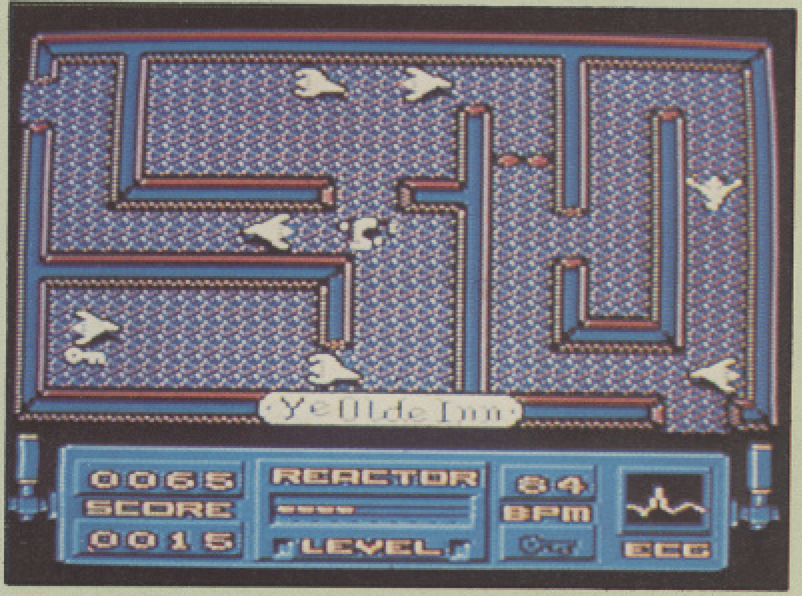
Phantom is original and well worth buying for the sheer pleasure of playing it. So when it comes to the final conflict and you have rumbles in your attic or creepies in the cellar then "Who yer gonna call?" – TyneSoft.

Neil Fawcett

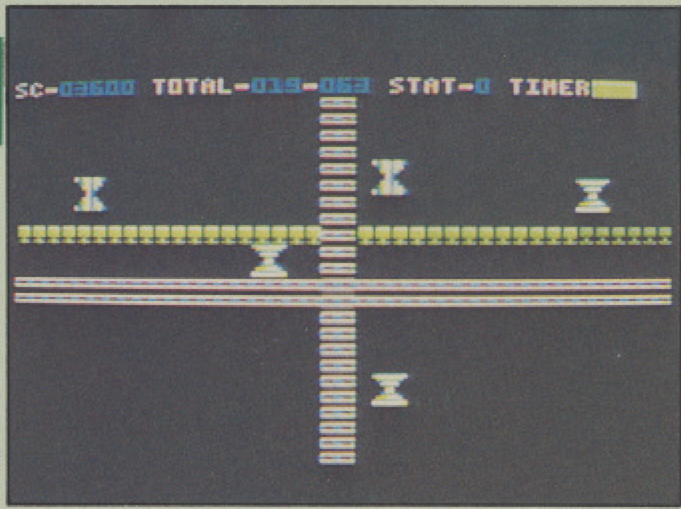


Sound	*10*
Graphics	*9*
Playability	*9*
Value for money	*9*
Overall	*9*





Weary waggling



Program: Frenesis
Price: £1.99
Supplier: Mastertronic, 8-10 Paul Street, London EC2A 4JH.
Tel: 01-377 6880

ALTHOUGH Frenesis describes itself as a game guaranteed to bring you near total nervous collapse, my guess is that it is more likely to be caused by boredom from monotonous gameplay.

You are armed with a Statron which is actually two thick bars, one running vertically down the screen, the other horizontally.

Each bar can be moved separately against a plain backdrop, the vertical one going left and right and the horizontal bar, up and down. The movement is controlled by an appropriate tug on the joystick.

Enter the aliens, stage left, right, and all ways. These particular meanies are not visually striking, being either circular, diamond or other sharp-angled shapes.

Your task is to destroy the horde before progressing to the next level.

The way to exterminate the infestation is by moving one of the bars across its path – the aliens explode on impact. If aliens are heading from the right, sweep the vertical bar from the left. Pink arrows on the bar point the direction the bar is currently facing.

You also have some smart bombs at your disposal, – triggered by pressing the fire button. They will rid you of all the aliens in the immediate vicinity.

And that's it, really. There are 40 waves of aliens to get through and while it gets faster and more furious, you are still simply waggling one of two bars back and forth. I grant that dextrous handling of your Statron is needed to make progress but the game failed to catch my imagination. It's all too much of a muchness.

Frenesis was written by Tony Takoushi, well-known arcade games fan. Despite his wide experience of arcade action, I'm afraid he hasn't produced a stimulating game.

Frenesis doesn't come anywhere near generating the sort of excitement that many other games for the Atari have managed to deliver.

Better graphics, less simplicity and much more gameplay variety might have awakened my interest. As it is, although this game is cheap, you'd be advised to have a look at some others in the Mastertronic range. This is not one of their finer offerings.

Bob Chappell

Sound	5
Graphics	4
Playability	4
Value for money	5
Overall	4

There you pogo



Program: Sprong
Price: £7.95 (cassette), £9.95 (disc)
Supplier: Red Rat Software, 11 Fennel Street, Manchester M4 3DU.
Tel: 061-835 1055

THE main character in Sprong is some sort of demented Aussie jumping around on a pogostick. It brings tears to my eyes just thinking about it.

Anyway, you set off to find the fabled Lost Golden Pogostick, spurred on by the wailing of Danny Boy. While I like to think I have an open mind on musical matters, I was glad to be able to turn this particular cacophony off.

You are given five lives to begin with and there are chances to win extra lives. Each screen has to be completed inside a time limit and there are 50 screens to pogo through.

Moving from left to right your progress may be checked by a number of obstacles and hazards. These include lava flows, raging fires, laser beams, acid rain, bomb-dropping helicopters, meteors and one or two others.

These can be dodged by careful timing of your movement or avoided by hopping on to and across platforms, conveniently strewn about the place. The platforms can be of the rock-steady or distinctly temporary variety.

You hop gently along, moving left or right. Pressing the fire button increases the height and length of the jump. The springing movement is good and bouncy and adds to the difficulty when trying to assess particularly tricky jumps.

Should you lose your last life 38 screens into the game, you don't have to go back to the beginning next time round.

On restarting you can choose to begin at screen 10, 20, 30 or 40 depending on how far you reached. Even as an absolute beginner you can start on any screen between 0 and 9.

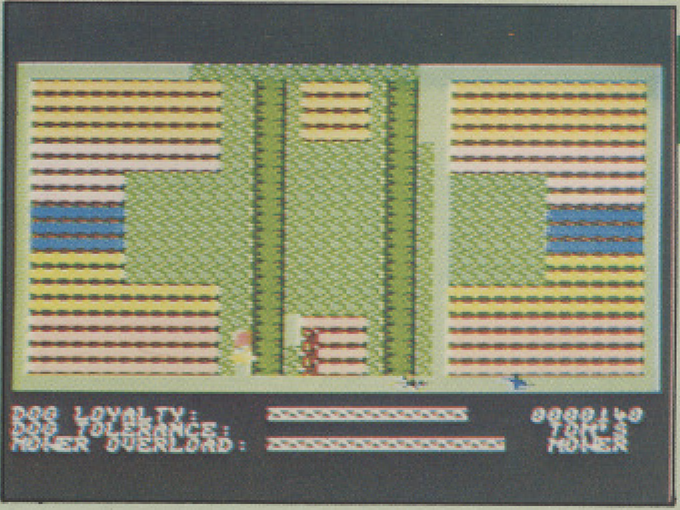
The graphics are bright and cheerful, though blocky and rather uninspired. The raging fires are little more than glowing embers, the background scenery could have come from Legoland and as for the lava flows – well I've seen more animation in our pumice stone on bath night.

There's nothing new under the sun, so goes an old adage – and Sprong by Red Rat Software certainly does nothing to try to disprove it. On the other hand Sprong is well put together and is reasonably challenging.

Niels Reynolds

Sound	6
Graphics	6
Playability	7
Value for money	7
Overall	7

Cutting it fine



Program: Hovver Bovver
Price: £1.99
Supplier: Mastertronic, 8-10 Paul Street, London EC2A 4JH.
Tel: 01-377 6880

A GAME about lawn mowing by Jeff Minter? What, he of the megatomic, all-action, rip-roaring, blast-em-out-of-the-sky fame? No, it can't be the same Minter.

But it is. Hovver Bovver is not a new game – in fact it came out on the Commodore 64 way back in '83.

The game has you borrowing a neighbour's hover mower to cut a series of lawns. You've barely started cutting your first swathe when the neighbour decides he wants his mower back. Then begins the chase, you racketing around the lawns, flower beds and hedges with the neighbour in hot pursuit.

If you go too berserk with the mower, it overheats and cuts out, causing a hiatus in your manicuring exploits until it has cooled.

Should you send your mower ploughing across one of the many flowerbeds, an angry gardener joins in the pursuit.

One way of fending off pursuers is to set Rover, your faithful dog, on to them.

The gardener and Rover, sensitive souls, will never cross a flower bed unless you have slashed a path through it. Not so the neighbour, who will trample anything in his desire to recover the mower. It pays to play the vandal to keep the edge on them.

You have three lives and 16 gardens to conquer. Thereafter, you get the lot again at a faster speed. You can begin on any of the first eight lawns you like and have a one or two-player game.

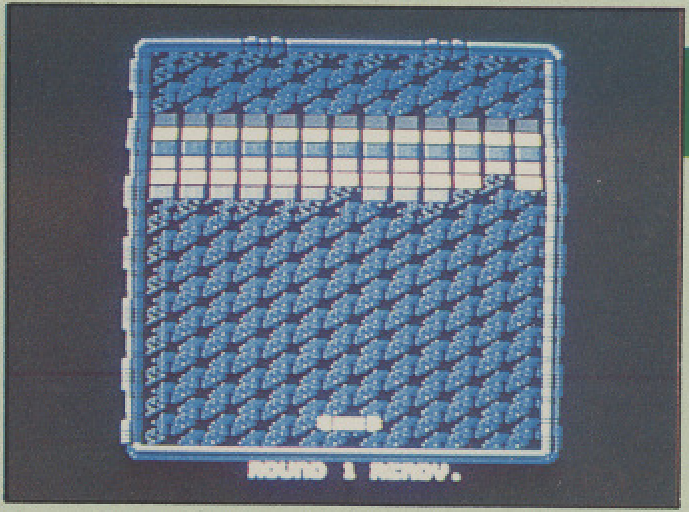
The view of the action is from directly overhead which, although it now looks a bit dated, is cleverly done.

Music (a jaunty rendition of "In an English Country Garden") and sound effects are excellent. Hovver Bovver offers many an enjoyable, fast-action bout of daffy fun. Should be top of your shopping list.

Bob Chappell

Sound	*9*
Graphics	*8*
Playability	*9*
Value for money	*10*
Overall	*9*

Breaking out



Program: Arkanoid
Price: £8.95 cass £12.95 disc
Supplier: Imagine, 6 Central Street, Manchester M2 5NS.
Tel: 061-832 6633

WHO would have thought that the game of '87 would be a relative of the legendary program Breakout?

Well, Imagine thinks it has a winner with its latest release Arkanoid. It looks like Breakout but has many hidden surprises.

Imagine has already converted the original arcade version of Arkanoid on to other computers including the ST with considerable success but I'm sorry to say that the Atari 8 bit version is well below average.

The game has a very simplistic form – you control a bat in the form of a short tube. This must be used to keep a bouncing ball from reaching the base of the screen. The ball must then be ricocheted among a maze of coloured bricks, breaking down the wall until all are destroyed and then you go on to the next level. I know it sounds exactly the same as Breakout but there are nice additions to make it more fun.

Each level has a different pattern of bricks and various bricks need more than one hit to remove. Some have coloured one-lettered capsules hidden behind them and as soon as you destroy one the capsule appears and falls down for you to catch.

Each capsule has a different colour, identifying label and different effect. Catching a new capsule will negate the operation of any previously caught capsule.

The best capsule in most cases is the L for Laser. Your bat turns into a double laser which can blast the bricks. The instructions do say that a D capsule exists – breaking the ball in to three – but I never got one.

Released at intervals through slots at the top of the screen are aliens that cause great confusion between you and the ball. If the ball collides and kills an alien the ball can rebound in any direction.

There are 32 screens to work through before the climax confrontation with the Dimension Changer, whoever or whatever that is.

Arkanoid can be played by one or two players and the bat is controlled by either paddles, joystick or the keyboard.

I have seen and played the ST version and this makes me feel even more gramming of the 8 bit version.

The game lacks in graphics, the colours clash making the game at times impossible to see, there is no music and it seems to give capsules out by the dozen making each level too easy to complete.

I feel that a lot more could have been done especially with such an easy programming task as Breakout.

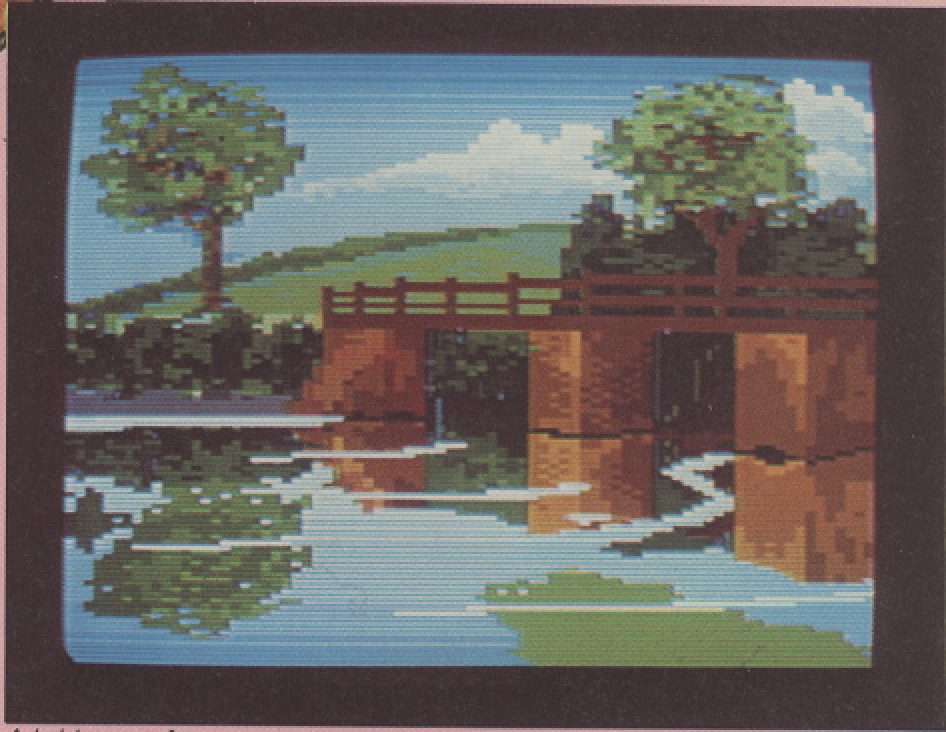
Richard Vanner

Sound	*4*
Graphics	*5*
Playability	*4*
Value for money	*2*
Overall	*4*

Atari User Palette

LOTS of pictures have dropped into our mailbag since last month's Pallette, including some of the demonstration pictures from Red Rat's Technicolour Dream software illustrated here.

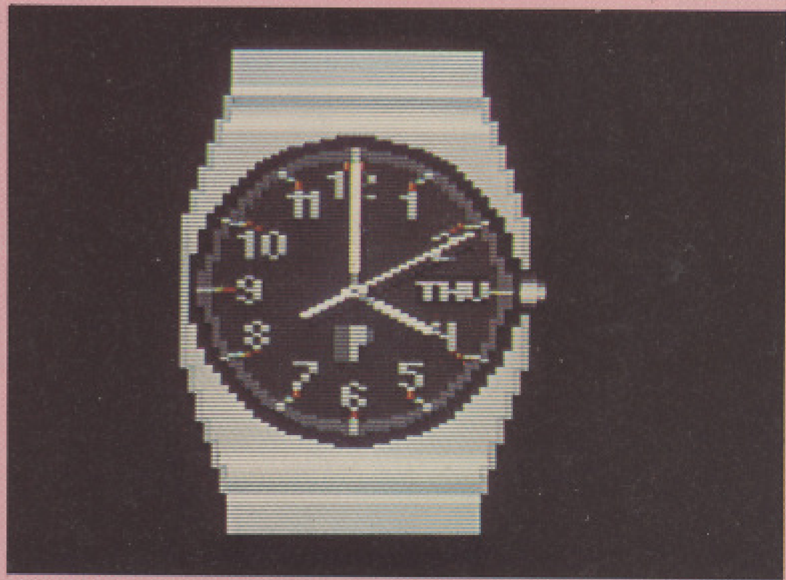
If you would like to see your masterpieces in print, send them to: Palette, *Atari User*, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.



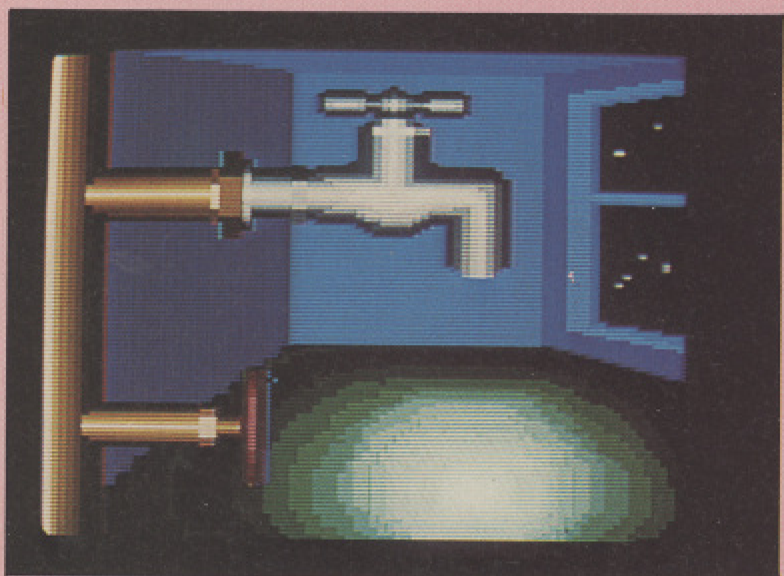
A bridge too far



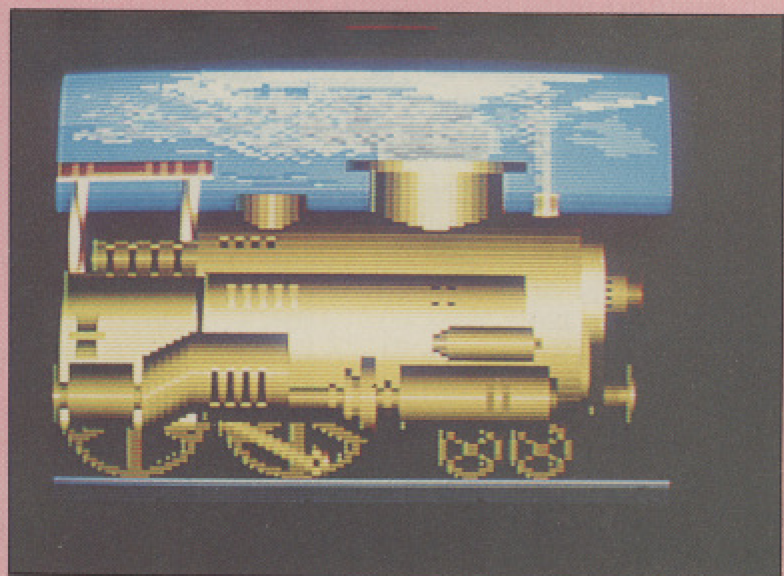
Redrat logo



Watch it!



On tap



Going loco

START OF NEW SERIES

SPECIAL FX



IN this new series we'll delve deep into the unknown areas of your Atari computer. FX will give you some insight into what can be achieved by using a little imagination and harnessing the many hardware functions available.

RICHARD VANNER shows how to produce amazing displays with your micro

We start off this month with a machine code routine that bends player missile graphics down the screen. This shows how it is possible to change the player missile graphic (PMG) X positions as the electron beam moves down the screen. Both a Basic version and the machine code source program are given.

Type in the Basic listing, save it and RUN it. A breakdown of how it works is given in Table I. After a short pause the screen will display diagonal lines and stars moving across the screen.

Note that there are only four PMGs on the screen. How is this done? Well, let's look at the assembly listing.

Most of the work is done between lines 450 to 950. The X positions of each sprite are taken from location 20, which is increased every vertical blank (every time a TV frame is displayed). Then the positions are altered by the angle values, and the new PMG coordinates are set after waiting for the horizontal sync (WYSNC $D40A).

This procedure of changing the X-positions is continued until the value of the vertical counter (VCOUNT $D40B) reaches 120.

This indicates that the electron beam is near the base of the screen and nearly ready to re-display a new frame. Location 20 is increased by the Operating System during the vblank period, which gives a new position for the PMGs to start from.

Don't worry if you don't understand how the machine code works, because the Basic program has been written so that you can use the code in your own programs.

You could try altering the two angle variables *ANGLE1* and *ANGLE2* or change the widths of the player missiles and the data stored within them.

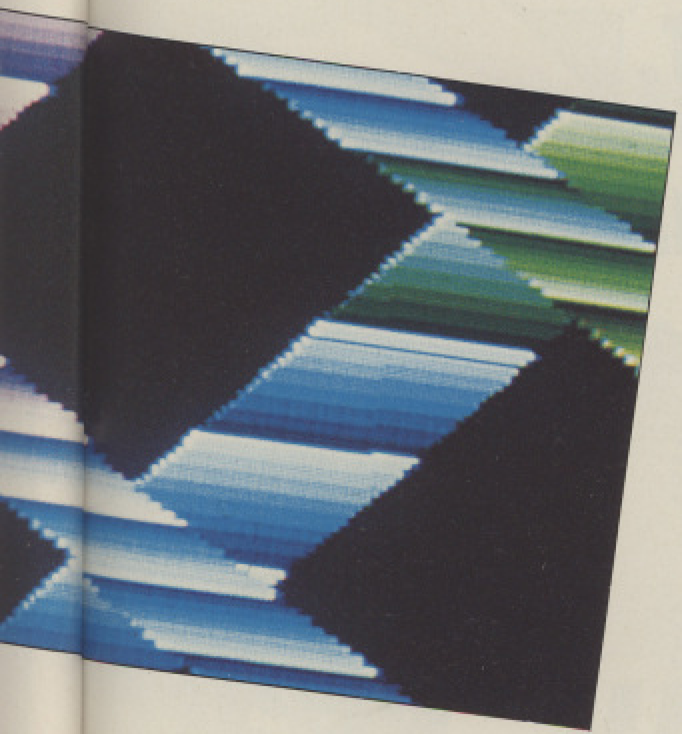
Unfortunately, when you change graphics mode the PMG area becomes corrupted, so make sure you're in the correct mode when you use the routines in your own programs.

Another limitation in the program is the fact that it spends all its time changing positions and checking for the Start key: To overcome this problem you must use a feature called the Display List Interrupt (DLI).

● *Next month we'll look at how to set up a DLI and give you listings that will split sprites and colours which will run independent of your Basic program.*

80-100	Sets up 1k of space for PMGs and sets up A$ which holds the machine code.
110-180	Tells the ANTIC chip-enable PMGs and sets the player address pointers.
190-240	Clears all player graphics memory.
250-300	Fills each player with some form of data. You can change this to your own requirements.
320-340	Copies machine code data into A$.
350	Sets *ANGLE1* and *ANGLE2* to 5 and 70 respectively. Try changing these to various values. Low values for lines and high values for star type effects.
370-400	Sets player widths. Values poked here can be 0 or 2 normal, 1 double or 3 for quadruple size.
420-440	Prints a message on to the screen.
450	Calls the machine code that is stored in A$ with the two parameters *ANGLE1* and *ANGLE2*.
460	Ends the program.
2000-2400	Holds the data for the machine code.

Table I: Breakdown of the Basic program



```
10 REM ***************************
20 REM * FX #1 'FLYING SPRITES' *
30 REM *                        *
40 REM *  PRESS SYSTEM RESET    *
50 REM *    BEFORE RUNNING      *
60 REM **************************
70 REM ALLOCATE TOP FOR PMG DATA
80 DIM A$(400),B$(1):MEM=PEEK(106)-8
90 POKE 106,MEM:GRAPHICS 8
100 GRAPHICS 0
105 REM *** INIT PMGS ***
110 POKE 53277,3
120 POKE 559,62
130 POKE 623,33
140 POKE 54279,MEM
150 PLAYER1=MEM*256+1024
160 PLAYER2=PLAYER1+256
170 PLAYER3=PLAYER2+256
180 PLAYER4=PLAYER3+256
185 REM *** CLEAR PMG AREA ***
190 FOR A=0 TO 255
200 POKE PLAYER1+A,0
210 POKE PLAYER2+A,0
220 POKE PLAYER3+A,0
230 POKE PLAYER4+A,0
240 NEXT A
245 REM *** POKE IN PMG DATA ***
250 FOR A=30 TO 222
260 POKE PLAYER1+A,255
270 POKE PLAYER2+A,255
280 POKE PLAYER3+A,1
290 POKE PLAYER4+A,128
300 NEXT A
310 REM *** COPY DATA TO A$ ***
320 FOR A=1 TO 135:READ DAT
330 A$(A,A)=CHR$(DAT)
340 NEXT A
350 ANGLE1=5:ANGLE2=70
360 REM *** PMG WIDTHS ***
370 POKE 53256,0
380 POKE 53257,1
390 POKE 53258,3
400 POKE 53259,1
410 REM *** SET UP SCREEN ***
420 POKE 752,1:SETCOLOR 2,0,0:POSITION
 11,7:? "ATARI USER FX #1"
430 POSITION 12,8:? "Stars + Stripes"
440 POSITION 10,10:? "PRESS START TO E
XIT"
450 X=USR(ADR(A$),ANGLE1,ANGLE2)
460 GRAPHICS 0:END
2000 DATA 104,104,104,133,208,104,104,
133,209,173,11,212,208,251,165,20,141,
0,6,141,2,6,24,101,20,141,1
2100 DATA 6,141,3,6,141,10,212,173,0,6
,141,0,208,141,18,208,173,1,6,141,1,20
8,141,19,208,173,2
2200 DATA 6,141,2,208,141,20,208,173,3
,6,141,3,208,141,21,208,24,173,0,6,101
,208,141,0,6,24,173
2300 DATA 1,6,101,208,141,1,6,56,173,2
,6,229,209,141,2,6,56,173,3,6,229,209,
141,3,6,173,11
2400 DATA 212,201,120,208,174,173,31,2
08,201,6,208,145,169,0,141,0,208,141,1
,208,141,2,208,141,3,208,96
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	4063	20	5534	30	3323
40	5652	50	5034	60	4063
70	6038	80	5485	90	4475
100	2039	105	3552	110	2136
120	1973	130	1941	140	2880
150	3729	160	4078	170	4082
180	4086	185	4262	190	2546
200	3216	210	3219	220	3222
230	3225	240	1329	245	5059
250	2427	260	3591	270	3594
280	3224	290	3601	300	1329
310	4430	320	4266	330	2831
340	1329	350	3524	360	3875
370	2116	380	2120	390	2127
400	2122	410	4552	420	11149
430	7336	440	14449	450	5457
460	3046	2000	14607	2100	13444
2200	13461	2300	12800	2400	14708

Assembly listing

```
0100 ;
0110 ;START ADDRESS
0120 ;Program is relocatable.
0130 ;
0140      *=  $4000
0150 ;
0160 ;System equates
0170 ;
0180 WYSNC = $D40A
0190 VCOUNT = $D40B
0200 XPOS1 = $0600
0210 XPOS2 = $0601
0220 XPOS3 = $0602
0230 XPOS4 = $0603
0240 HPOSP1 = $D000
0250 HPOSP2 = $D001
0260 HPOSP3 = $D002
0270 HPOSP4 = $D003
0280 PCOL1 = $D012
0290 PCOL2 = $D013
0300 PCOL3 = $D014
0310 PCOL4 = $D015
0320 ANGLE1 = $D0
0330 ANGLE2 = $D1
0340 ;
0350 ;START OF CODE
0360 ;
0370 BEGIN
0380      PLA            ;#of args off
stack
0390      PLA
0400      PLA            ;Angle1
0410      STA ANGLE1
0420      PLA
0430      PLA            ;Angle2
0440      STA ANGLE2
0450 WAIT LDA VCOUNT ;Wait for top
0460      BNE WAIT    ;of screen
0470      LDA 20      ;Set PMG
positions
0480      STA XPOS1
0490      STA XPOS3
0500      CLC
0510      ADC 20
0520      STA XPOS2
0530      STA XPOS4
0540 LOOP STA WYSNC   ;SYNC with screen
0550      LDA XPOS1    ;Set PMG 1
0560      STA HPOSP1   ;X-Position
0570      STA PCOL1    ;& Colour
0580 ;
0590      LDA XPOS2    ;Set PMG 2
0600      STA HPOSP2
0610      STA PCOL2
0620 ;
0630      LDA XPOS3    ;Set PMG 3
0640      STA HPOSP3
0650      STA PCOL3
0660 ;
0670      LDA XPOS4    ;Set PMG 4
0680      STA HPOSP4
0690      STA PCOL4
0700 ;
0710 ;Set New X for angle
0720 ;
0730      CLC
0740      LDA XPOS1
0750      ADC ANGLE1   ;Add angle1 sent
0760      STA XPOS1    ;From BASIC prog
0770      CLC
0780      LDA XPOS2
0790      ADC ANGLE1   ;Add angle1
0800      STA XPOS2
0810      SEC
0820      LDA XPOS3
0830      SBC ANGLE2   ;Subtract angle2
0840      STA XPOS3
0850      SEC
0860      LDA XPOS4
0870      SBC ANGLE2   ;Subtract angle2
0880      STA XPOS4
0890 ;
0900      LDA VCOUNT   ;End of screen?
0910      CMP #120
0920      BNE LOOP     ;No loop back
0930      LDA $D01F    ;Start key?
0940      CMP #6
0950      BNE WAIT     ;No
0960      LDA #0       ;Yes Zero
0970      STA HPOSP1   ;X-Position of
0980      STA HPOSP2   ;PMGs and exit
0990      STA HPOSP3   ;Back to BASIC
1000      STA HPOSP4
1010      RTS
```

MEGAPAC

520 STFM SYSTEM BY A.S.&T.

The new 520 STFM from ATARI has been an instant hit since its announcement. The design has gained from experience with earlier ST and STM machines and the result is a practical and superbly engineered computer that will easily find its place in your home as well as in your business.

MEMORY:

The basic 520 STFM has 192K bytes of ROM, an optional 128K bytes of plug-in ROM cartridges and 512K of RAM. The MEGAPAC 520 STFM has bigger memory — a full ONE MEGABYTE of RAM, like the 1040 STF.

DISC DRIVES:

The basic 520 STFM has a built-in single-sided disc drive. The MEGAPAC 520-STFM comes with two drives, one internal and one external. The latter is double-sided, offering twice the capacity (720K) of the built-in drive (360K). Your disc bill can be cut by almost half when compared with that of basic 520 STFM users.

PROCESSOR:

The Central Processor unit (CPU) is a Motorola 16/32 bit 68000 chip, running at a clock speed of 8 MHz. It is further enhanced by Atari's own custom ICs providing a Direct Memory Access (DMA) channel for fast data transfer with other peripherals such as the ATARI SH204 Winchester drive or the Atari Laser printer (available soon) and a real time clock.

DISPLAY:

The 520 STFM can display 40 or 80 column text on any domestic TV or colour monitor such as the Philips CM8533 or the dedicated ATARI SM125 high resolution monochrome monitor. Graphic is 600 × 400 pixels on the SM125, 600 × 200 pixels in 4 colours or 320 × 200 pixels in 16 colours on a colour monitor or TV. The colour palette contains 512 possible colours. Some ATARI software indeed uses the exceptional display hardware to produce stunning graphics with up to 256 colours at once.

MIDI INTERFACE:

The 520 STFM has 3 programmable sound voices and a Musical Instrument Digital Interface (MIDI) to allow direct connection to a wide range of musical organs and synthesizers such as the Casio CZ230S.

MOUSE:

The 520 STFM has its own dedicated mouse as part of its standard hardware.

PERIPHERAL CONNECTORS:

The 520 STFM can be easily expanded by plugging in 'add-ons' through its ports. They will accept printer (Centronics port), Modem (RS232 port), musical instruments (Midi port), sensors (joystick port) and fast intelligent devices such as network, Winchesters, laser printer etc (SCSI port).

BUILT-IN SOFTWARE IN ROM:

The 520 STFM has 192K bytes of permanent software in ROM. This comprises GEMDOS, the disc operating software which is now becoming the dominating standard for 16 bit computers, and GEM, the Graphic Environment which uses pictures and drawing instead of cryptic messages to communicate with the user and the electronic Mouse in place of the keyboard to enter the user's commands.

SOFTWARE ON 5 DISCS:

The MEGAPAC 520 STFM comes with 5 discs, containing an impressive collection of software by any standard:
Disc number 1: contains the BASIC language.
Disc number 2: contains LOGO, + DOODLE + MEGAROIDS, and STWRITER a WORDPROCESSOR program.
Disc number 3: contains Neochrome, a painting program and demo pictures.
Disc number 4: contains CPM utilities.
Disc number 5: contains the CP/M emulator.

FULL ONE YEAR GUARANTEE



720K DOUBLE SIDED SECOND DRIVE

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THE PRI

ALSO AVAILABLE F

SYSTEM BUILDERS . . .

ATARI COMPUTERS:

1 520 STM computer keyboard, external PSU, 512K RAM, 5 s/w discs £259.00
2 520 STFM computer keyboard, internal PSU, internal single sided (360K) disc drive, 512K RAM, 5 s/w discs £371.00
3 520 STFM with monochrome (SM125) monitor £464.00
4 520 STFM+ computer keyboard as above but with 1 MB RAM £439.00
5 520 STFM+ with monochrome (SM125) monitor £533.00
6 MEGAPAC 520 STFM £539.00
7 MEGAPAC 520 STFM with monochrome monitor £633.00
8 1040 STF computer keyboard, internal PSU, internal double-sided (720K) disc drive, 1 MB RAM, 5 s/w discs .. £556.00
9 1040 STF with monochrome monitor £649.00
10 MEGAPAC 1040STF (twin double sided drives) £655.00
11 MEGAPAC 1040 STF with monochrome monitor £749.00
12 SUPER PACK 520STM with FD200 + Mouse £349.00

MONITORS:

1 SM125-12" high resolution (600 × 400) B/W monochrome £135.00
2 SC 1224-12" medium resolution (600 × 200) colour monitor £372.00
3 Philips CM8533-14" medium resolution colour monitor £299.00
4 NEC Multisync-14" colour monitor, can replace SM125 and SC1224 to display hi-res monochrome and colour £699.00

DISC DRIVES:

1 SF354 single sided disc drive with PSU, 360K £139.50
2 SF314 double-sided disc drive with PSU, 720K £185.50
3 A.S.&T. 1000C double sided disc drive for STF or STFM, uses ST's PSU £99.00
4 Stand-alone PSU for the above if required (eg 520 ST) £25.00
5 Twin 1000C with PSU for 520 ST £199.00
6 A.S.&T. 1000F – 5¼", double-sided disc drive, 720K, alternative choice to SF314 or A.S.&T. 1000C but with 40/80 track switch for IBM PC and compatible discs £124.00
7 Stand-alone PSU for the above if required £25.00
8 SH 204 – 20 Megabyte hard disc (Winchester) £599.00
9 SH 204 – 40 Megabyte hard disc (Winchester) £1,149.00

PRINTERS:

ATARI SMM 804 printer, 80 cps £199.00
2 STAR NL-10 compatible printer. 120 cps in draft mode and 30 cps in near letter quality (NLQ). All control codes are EPSON FX compatible £269.00
3 STAR NX-15 compatible printer. 120 cps wide carriage £385.00
4 Amstrad DMP-4000, 15" carriage, draft quality speed: 200 cps, NLQ speed: 50 cps. Friction and tractor feed. Will produce superb screen dumps. Special offer £359.00
5 JUKI 5510 printer. 180 cps in draft, 40? cps in near letter quality £329.00
6 MP165 compatible printer. 165 cps in draft mode. 40 cps in near letter quality. Exceptional value £219.00
7 JUKI 6100 daisy wheel printer. 20 cps £285.00
8 Black ribbon for all dot matrix printers from £5.00
9 Different faces Daisy Wheels from £15.00
10 Fanfold paper 11" × 9.5", 60 gsm, 2000 .... £14.00
11 Fanfold paper 11" × 9.5", 100 gsm, 2000 .... £30.00

BOX OF 10 DISCS:

1 Sony 3.5" single sided, double density £22.00
2 Sony 3.5" double sided, double density £29.00

CABLES:

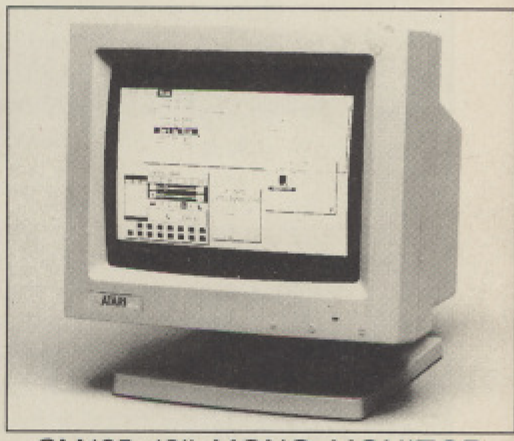
RGB video leads for Sony or Grundig TV with Euro connector, Philips CM8533 .... £15.00
Atari drive leads £15.00
Printer leads £15.00
Modem leads £15.00

BABT APPROVED MODEMS:

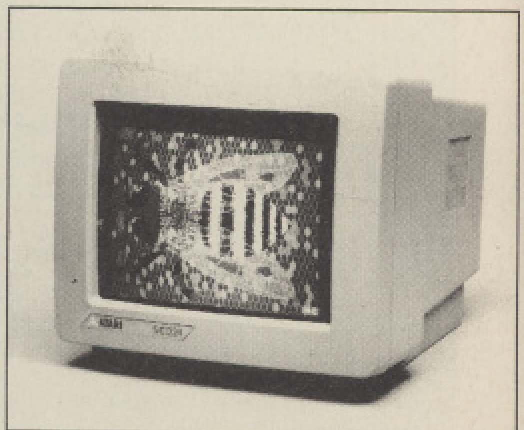
1 WS4000 .... £172.44
2 WS3000 .... £569.25
3 Fastcom terminal software, supports also Prestel £49.95
4 BBS Version 2.0 for Bulletin Boards £49.95

MIDI INSTRUMENTS:

1 Casio CZ230S £295.00
2 Easy Track Midi software £59.95



SM125 12" MONO MONITOR



SC1224 12" MED RES COLOUR

A close look at Atari Dos

Part 6 of Andre Willey's series on the Atari's input/output facilities

OVER the past few months we've been looking at facilities provided by the Central Input/Output System – or CIO. You should now be familiar with the way that the operating system uses CIO to pass data to and from the various peripherals, and how you can use those same CIO handlers from within your own programs.

One of its most powerful and useful facilities is to supply a common protocol for data transfer. This allows a program to send or receive bytes of data without knowing anything about the hardware device it is accessing.

This makes it very easy to add new drivers to the existing set, and the OS allows plenty of space in the Handler Address Table for just such a purpose.

The most complex driver that you are likely to come across is the disc operating system (or Dos as it is better known), and over the next couple of months I'll be showing you in more detail how it works.

There are many different types of Dos available, but the most common is the well known Atari Dos 2.0. This has been expanded recently to give us Dos 2.5, but the main principles of operation are exactly the same.

Various other manufacturers have produced their own Dos software but most of them use the same basic disc format. Many also add their own special facilities, but for the moment we'll concentrate on the standard Dos 2.0/2.5 format.

The first thing to realise is that a disc drive differs from most other peripherals in that it is a *random access* device – it can read and write data at various different positions on the disc under software control.

While a cassette must be set for record OR playback by the user, a disc is perfectly capable of being written to or read from whenever the computer requires. This opens up the possibility of transferring data between files on a single disc, or changing the data contained within one file – both of which are impossible when using tape.

Any Dos must therefore provide a number of operations. It must allow many different files to be stored and accessed on each disc and these must be capable of being read or updated and then deleted again when they are finished. There should also be a set of housekeeping routines for such tasks as copying files, altering the names of files, making new or backup discs and so on.

The disc drive is actually only capable of five very simple operations. The first is to *Format* a blank disc. This effectively partitions the new disc into 720 separate blocks of data known as *sectors* (see Figure I).

Each of these is 128 bytes long so a full disc can store 92,160 bytes (90k). The 1050 drive is also capable of formatting in a special enhanced density mode which contains 1040 sectors instead of 720 thus giving a total capacity of 133,120 bytes (130k).

The next three operations that the drive can perform are *Write Sector*, *Write Sector with Verify* and *Read Sector*. These allow you to store or retrieve new data into any sector. Finally the drive can also let the computer know its current *Status* and provide information about the last

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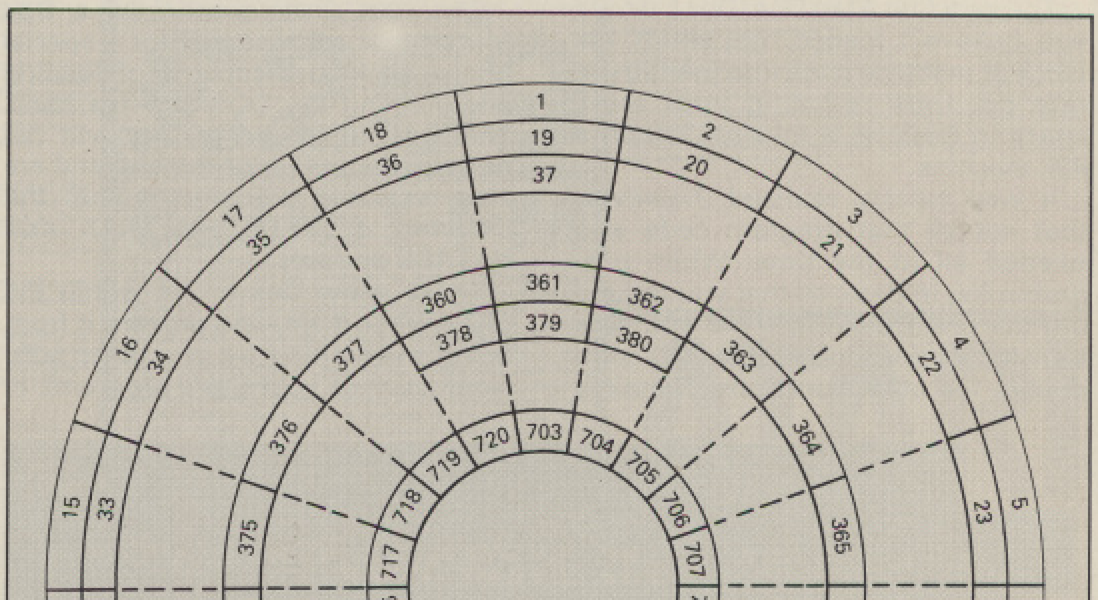


Figure I: Sectors on a single density Dos 2.5 disc

operation it completed and the type of disc in the drive.

In addition, you may recall from Len Golding's series on autobooting that the OS is only capable of a very simple boot operation – that of loading a set of consecutive sectors from the start of whichever disc is in drive one when the power is turned on.

All this leaves us with a picture which is a far cry from the all-singing Dos specifications outlined earlier. If all the computer can do is manipulate these sectors containing just 128 bytes, how can Dos ever do all those clever tasks we are by now used to?

Perhaps now you understand why I stated that Dos is probably the most complex – and largest – of the device drivers. It's also why Atari decided to load it in from the disc at powerup time rather than permanently use up an extra 10k of memory space that would be completely wasted as far as tape users were concerned. The whole of the original OS only took up 10k, so incorporating Dos as well would have doubled the rom space required.

The very first Atari Dos (Dos I, would you believe?) loaded this entire 10k block of machine code into memory in one go, thus reducing your work space in Basic to a meagre 27k on a 48k machine.

It was quickly realised, however, that not all that program code was needed all of the time. When programming in Basic all that you require are the raw Open/Close file and data transfer routines, plus a few XIO commands for other functions. Certainly there is no point in wasting the extra memory taken up by the menu system which is only needed occasionally.

Dos 2.0 splits this software into two parts: Part one, contained in the DOS.SYS file, is the actual 5k disc handler routine used by CIO. Part two, the 5k DUP.SYS file which is only loaded when you type DOS, contains all the menu facilities such as duplicate disc and copy files (See Figure II).

The routines contained in the DOS.SYS file allow the user to do all the things we require of a disc system without concerning ourselves with which sectors are being used. Dos works out which sectors it will have to use for which files, and all we need worry about are filenames and the bytes of data contained in them.

You may have noticed a slight discrepancy in what I've said so far. If the file DOS.SYS tells the computer how to treat sectors as separate files, how does the DOS.SYS *file* ever manage to load itself into memory? Well, the simple answer is that it doesn't!

The first three sectors of a Dos format disc are reserved for a special bootstrap loader capable of loading and running the DOS.SYS file itself. These sectors load at $700 via the normal disc autoboot method and are also responsible for setting up the DOSINI, DOSVEC, MEMLO and HATABS pointers.

These allow Dos to act within the CIO environment, and prevent it from being overwritten by any other software (such as your Basic program). In addition this code will be run again whenever System Reset is pressed in order to reinitialise the disc handlers.

Once the boot process is finished you will see the familiar READY prompt from Basic. If you type PRINT FRE(0) you will get a result of 32,274 bytes – or about 32k. Without Dos this figure would be 37,902, so Dos has in fact taken up 5,636 bytes of memory.

This doesn't include the disc utilities menu, which is only loaded from the DUP.SYS file when you type DOS. This uses up an extra 5k of memory, which will, of course, wipe out any Basic program you might be working on. To avoid this, you can set up a file called MEM.SAV on your Dos disc.

When this is present, the first 5k of your program space is saved into this file as soon as you type DOS. Then, when you have finished with the utilities menu and you enter B to return to Basic, the contents of the MEM.SAV file are copied back into memory and your program is intact once again.

At this point it's worth mentioning one of the major differences between Dos 2.0 and Dos 2.5 – the ramdisc. As you will know if you use a 130XE, Dos 2.5 allows you to use that extra 64k of banked memory as a second disc drive. It also stores DUP.SYS and MEM.SAV on the ramdisc which means that there is no appreciable delay while the save/load operation takes place.

If you don't have a 128k machine and must use a normal floppy disc for the MEM.SAV file it takes a little over 21 seconds before the menu appears. Without MEM.SAV this is reduced to just seven seconds, so many people resort to simply SAVEing their programs before typing DOS.

To understand the disc system a little better, let's look at the way the computer uses those 720 (or 1040) sectors to store your programs.

Figures III and IV show the disc format for a Dos 2.5 disc in single or

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Sectors	Contents
1-3	Boot information
4-359	Free for files
360	VTOC
361-368	Directory information
369-719	Free for files
720	Not available from Dos

Figure III: Disc sector map for single density Dos 2.5 discs

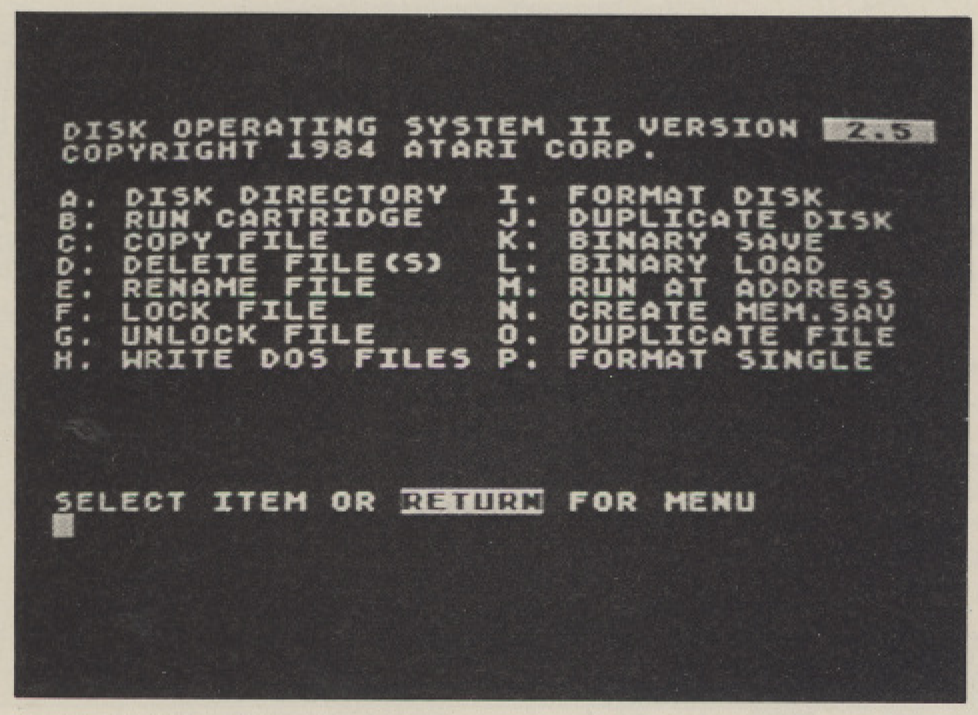


Figure II: The Dos 2.5 menu

Sectors	Contents
1-3	Boot information
4-359	Free for files
360	VTOC
361-368	Directory information
369-1023	Free for files
1024-1040	Not available from Dos

Figure IV: Disc sector map for enhanced density Dos 2.5 discs

enhanced density. The first three sectors are always used for the boot information. These may not be used for file storage, even if you don't actually have a DOS.SYS file on that particular disc.

There are three other types of sector on the disc – directory sectors, file data sectors and the Volume Table of Contents (VTOC).

The directory information is contained in eight sectors near the middle of the disc (sectors 361 to 368). It is here that all of the file names are stored, plus any other information about the files such as length, starting sector, status and so on.

Each entry is 16 bytes long, so every sector can contain details of up to eight files - giving a maximum of 64 files per disc.

Just prior to the directory sectors comes the VTOC sector, numbered 360. This is probably the most important sector on the disc because it holds the table of free space which is referred to each time you want to write any information to the disc.

As each sector is filled up, Dos looks at the VTOC to find the next available unused sector. When this sector has been allocated to a file it is removed from the VTOC free list and marked as being unavailable. Only when you delete a file from the disc are those sectors marked as again being free.

The rest of the sectors on the disc are available for storing the files themselves, with the exceptions of sector 720 on a single density disc and sectors 1024 to 1040 in the case of enhanced density discs.

When Dos 2.0 was first developed, the software authors wrote their brand new system to use all 720 disc sectors, numbering them from 0 to 719. The hardware designers of the old 810 disc drive, however, programmed the unit to respond to a sector numbering system using numbers from 1 to 720 – most unusual in computer terms. Hence Dos 2.0 couldn't use sector 720 and the hardware couldn't use sector zero.

On a 1040 sector enhanced density disc, sector 720 is used just like any other but in this case the last few sectors can't be accessed because of a limitation of the 10-bit file sector numbering system used by Dos 2.0 which was never designed to go beyond 1024 - This means you lose 17 sectors at the end of each disc.

Why Atari designed the 1050 to use this unusual system of 1040 128-byte sectors, when the established norm for extra storage capacity was by then to use just 720 256-byte sectors, no one is quite sure – but the upshot of it all is that you lose about 2k of space from every enhanced density disc.

● *Next time we'll continue looking into the disc system and see how it stores and keeps track of all of your files and data. See you then.*

Program to suit the 1029 printer

I AM considering buying Mini Office II but would like a few points clarified. Would my Atari 1029 printer work with this particular program as most of the other utilities I own totally ignore this printer.

Also will the communications program operate using split baud rates and if it will not can you please explain what baud rates are available to me? – **A. F. Sharp, Teeside.**

● Mini Office II supports the Atari 1029 printer throughout the entire package as well as allowing the use of all Epson compatible printers.

The package allows you to create graphic dumps of all forms of graphs on your Atari 1029 printer as well as working perfectly with the other modules of Mini Office II.

In regard to your other query, the communications package does not allow split baud rates but does offer 300, 600, and 1200 baud, which facilitates most of the modems on the market for Atari computers.

Replacing keys

WITH reference to a letter in the July 1987 issue of Atari User *concerning the moving of the Pause key on a 1010 tape recorder and replacing a broken key with it. I recently did the same thing to my 1010 tape recorder and I replaced the broken key with the Pause key.*

I then found that Silica Shop actually sell replacement keys for this tapedeck. I sent off for two keys and received the keys very promptly for a price of £1.12 which included VAT, postage and packing. Silica Shop can be contacted on 01 309 1111. – **Kevin Kingsnorth, Banbury.**

Buying a disc drive

I OWN an Atari 800XL and tape recorder and am now considering buying a disc drive. I am unsure about what I get when I buy one, which Dos is the best to buy and how to use it. What sort of further commands will I get and do I need to load this Dos every time I use my drive? – **W. Golding, Liverpool.**

● When you buy an Atari 1050 disc drive you will get a power pack, serial I/O lead and discs. On one of these discs you will find Dos 3 which is not the best of the Dos files available but is probably adequate for your needs.

When working from Basic you must load your computer with Dos first or you will not be able to save any programs to disc once you have written them.

You do not always have to load Dos. When you load most games you simply use the game disc.

You receive a comprehensive list of commands on your screen when you load Dos, allowing you to format discs, copy Dos discs and generally edit and manipulate files from one disc to another.

As to which is the best Dos, all have very similar command options but you will find that Dos 2.5 is the most friendly and easy to use.

Software problems

MY friend has recently bought a new Atari 1040STF computer and it comes with a built-in mouse. This has a connector that looks the same as the joystick one on my Atari 800XL. Does this mean that I can use the mouse on my 8-bit Atari? – **D. Redmond, Harrogate, N. Yorks.**

● The connection is the same on both mouse and joystick and you will find that the mouse produces a value in location 54016 ($D300 hex) when you move it. The problem is that no software is yet available which recognises the values output by the mouse.

Music on call

THIS must seem a very simple question, but is it possible to play normal music through the Atari 1010 tape recorder and also is it possible to turn the recorder on and off via Basic without using the CLOAD or CSAVE command?

This came to mind when I tried to write a program to play some Christmas carols and found that I couldn't get the hang of the sound channels so I gave up in desperation.

Then I wondered if it was possible to play and control music through the recorder and so solve my problem. – **S. Buxton, London.**

● Yes, it is possible to play music through your 1010 tape recorder but the sound will come through the TV speaker and may sound a little distorted depending on the age and quality of the speaker inside your TV.

The way that this is accomplished will answer your second query as well. It is possible to control the recorder from Basic but it is hardly ever documented in manuals. To turn it on you simply type POKE 54018,52 then press Return.

If you put a music tape in,

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Connecting up to MicroLink

I OWN an Atari 800XL, disc drive and printer and wish to expand my system to include a modem. I was wondering if I joined MicroLink would I be able to have it charged directly to me instead of to my parents on the phone bill.

My other problem is that my system is in a converted attic and the phone is on the ground floor. Would the modem and the phone have to be side by side? – **N. Broadbent, West Yorkshire.**

● The only charge on your phone bill will be the cost of the telephone calls to the MicroLink computer. MicroLink charges are billed to you separately and payment is by a direct debit from your bank account.

To work out how much you would owe your parents for the use of the phone, the MicroLink bill specifies the connect time to the system at both peak time and off-peak time. You will, therefore, be able to calculate the total phone call charges. Because your system is in the attic, it will be necessary for you to get an extension from the telephone socket downstairs to a socket in the attic. It is possible to buy such extensions from most electronics shops.

press Play on the recorder and turn the volume on your TV up you will hear the music. If you want to turn it off type POKE 54018,60 then press Return. By including this in your programs you can have exciting music without the effort of programming it.

Software checkmate

IN a news item in the June issue of Atari User *it states that CDS Software claim that their chess program is the first 3D chess program for the 8 bit Atari. I would like to point out that Chessmaster 2000 from Software Country has been around much longer so I feel that the claim is invalid.* – **Len Fett, Sunderland.**

Atari on tape

COULD you please tell me how the Atari micro writes information to the tape recorder. This point is of particular interest to me after reading your autoboot series and I would like to know more on the technical side of how it is done. Also, what is this Pokey chip that is often mentioned in articles. – **A. J. T. Buckton, Manchester.**

● The way that the Atari writes information to the tape recorder is in fixed-length blocks at 600 baud (physical bits/second). Then a serial transmission is used to read or write data to the recorder.

The sound chip inside your micro handles any data streams coming into or out of your Atari in a set order: 1 start bit (space), 8 data bits (0 space, 1 mark), then one stop bit (mark).

Your sound chip sends or receives a byte by least significant bit first. The recorded block is 132 bytes long and is broken down into marker characters for measurement of speed followed by a control byte then by 128 data bytes and finally a checksum byte.

The chip that you have heard referred to as Pokey is in fact the sound chip and was given this name when the machine was first built.

The chip was new and is not available in any other micro and like the other new chips inside the micro such as Antic and GTIA was given a name. The Pokey chip also creates all the sound outputs that are available from Basic allowing you to obtain superb sound simply.

ATARI USER Mailbag

WE welcome letters from readers – about your experiences using the Atari micros, about tips you would like to pass on to other users . . . and about what you would like to see in future issues.

The address to write to is:

Mailbag Editor
Atari User
Europa House
68 Chester Road
Hazel Grove
Stockport SK7 5NY

Taxman's warning

IN THE article "Check up on the taxman" published in the June issue of Atari User *there were some errors.*

Overall it would be unwise for your readers to rely on the accuracy of the routine for checking their PAYE tax deductions. For the majority the routine will be in error by pence only, but for those whose taxable pay averages over about £340 per week, the error could be quite large. – **G. O. Lawton, Inland Revenue.**

Wrong listings?

I READ your magazine every month and find it very interesting. But whenever I type in one of your listings it never works, so I retype it and retype it checking every character and they still never work. So I have come to the conclusion that none of them work and that your listings are all printed wrong.

Could you please explain how the sound channels work. – **G. Gulline, Fife.**

● All the listings are taken directly from working programs and they are checked before we publish them so that they are correct. The problem is that even a small typing error will stop them working.

Take a lot of care when you type them in and make use of the Get It Right program that we published in the August 1986 issue of *Atari User*. This program will help you in your efforts, correct your typing errors and get a working program.

There are many complex ways of producing sound on Atari home computers, but it nearly always comes back to the Basic sound command. This takes the form of SOUND 1,10,10,10 and the numbers shown can

Adapting an Apple drive

I RECENTLY acquired a pair of Apple IIE disc drives which my firm had scrapped. When I tried to plug them into my 800XL I found that there appears to be no socket for it to fit in. On the back of the disc drive there is a 20 way ribbon cable and a label giving a warning – connect the cable only to the Apple II interface card. I have one of these, and now know that the drives are single side, double density, 40 track, 80 sectors per inch.

Inside the drive there is a disc analogue card, so can you please explain to me why I cannot use these drives on my micro. What modifications would I need to make and would I need to use the interface card? If so how would it connect to my 800XL. Would I also need a separate power supply as the drives take their power supply from the computer, and when connected would commercial software run on this drive? – **J. A. Oatham, Essex.**

● The disc drives on the Apple II computers are rather different from most other drives as they use a lot of electronic interfacing. This is why the interface card must be bought to use with the Apple II.

Unfortunately an awful lot of work on the electronics would have to be done to make it compatable with an Atari computer. It would probably not be worth the trouble when you could sell the drives and put the money towards a fully compatable Atari 1050 disc drive.

You would get Dos, and the correct lead and a power supply and you would have no problem running any of the commercial software available.

be changed to any other number within the parameters of the SOUND statement.

The first number indicates which sound channel you wish to use in the range 0 to 3 and the second number indicates the note you want to use. This can range from 0 to 255, giving you a lot of variety.

The third number indicates the distortion level of the note with the number 10 indicating a pure note. This number can range from 0 to 14 in even numbers only.

Finally the fourth number indicates the volume level of the note and this ranges from 0 to 15 with 15 being the loudest. By experimenting with this command you will be able to create some very interesting sound effects, and if you refer to the five liners section of this issue of *Atari User* you will find a program that will turn your computer into an electronic organ.

Adding a modem

I AM interested in adding a modem to my Atari 800 setup so that I can access MicroLink as advertised in Atari User. *However, I am not clear exactly what sort I need and what additional software and interfaces will be required. Can I access Prestel through MicroLink?* – **Chris Read, Milton, Keynes.**

● Adding a modem to your system is not as expensive as many people think and can be very useful.

There are several available for you to choose from. Prices range from £100 for a manual modem to a few hundred pounds for ones which will dial the MicroLink number for you automatically.

You will also need an 850 interface box or a lead to connect your Atari micro directly to a modem. You will also require a communications program.

Unfortunately you cannot access Prestel through MicroLink at present, but it may be possible in the future although no definite date has been set.

Holiday tips

YOUR readers may be interested in an idea I recently used to help me enjoy my holiday better. One of the things I dislike most is writing postcards, so I used Mini Office II to help.

Before I departed I set up a database file of my friends' names and used the label printer to print them out on sticky labels. Then I printed out an equal number of labels with the following text on them:

```
Having a great/lousy time.
Weather sunny/raining/dull.
Hotel excellent/good/poor.
Food scrumptious/eatable/
we just use the chip shop.
Locals are friendly/hostile.
```

It was then just a matter of fixing two stickers and a stamp to the cards, deleting the appropriate words and signing them. I hope this time saving idea will enable your readers to enjoy their holidays rather than waste them writing cards. And when it comes to Christmas, I've got the names on file ready to address the envelopes of the cards. – **Iain Jones, Clwyd.**

Converter converted

G. WATSON'S five-line decimal to Hexadecimal converter in the May issue of Atari User *is great. However, rather than entering A=USR(1600,number), I find that adding :GOTO50 to the end of line 50 makes the routine more useful.*

Since typing in Dave White's Fruit from the March issue of Atari User *I've hardly been able to get near my Atari for my wife playing on the bandit. It's a great program, and if she paid me what she's lost I could probably afford an ST by now.*

Finally, in the mass formatter by Colin Froggat in the June issue of Atari User, *the text is hidden in line 2 by POKE709,0. I suggest POKE709,10. I've also included a POKE 752,1 in line 5 to inhibit the cursor in the window when an error message is displayed. You seem to have used POKE 82,3 on these five-liners.*

Support missing

IN the May issue of Atari User, *which my son buys every month, there was a letter from someone who had sent for something from Computer Support UK, advertised in your magazine. They had not received it.*

I also sent for something from them costing £39.95 .

We have been trying to contact them since August 1986. Although we asked the help of consumer services all we got was promises.

After letters sent by our solicitor there was still no answer, so we applied for a court summons. We were given a judgement against Mr Lawson of Computer Support UK.

The bailiffs have told us that there is no one or any goods at 153 Parrock Street. – **Mrs. M. C. Sanderson, Growthorpe, Rotherham, Yorks.**

Mass formatter

WHEN I received the June 1987 issue of Atari User *I got very great enjoyment out of reading it. I would like to say it is one of the best issues I have read since its start.*

The only problem I came across was in the Five Liners Mass Formatter program.

In lines 3 and 5 the listing showed three brackets which are not on the keyboard.

They are meant to be the clear screen character (CHR$(125)) which is obtained by pressing Escape+Control+Clear. – **A. B. O'Neill, Hants.**

Display lists

I HAVE had an Atari 800XL for two years and would like to know what a display list is? I know it has something to do with the graphics mode but that seems to be the limit of my knowledge on this subject. – **B. Wise, Didsbury, Manchester**

● The display list is a series of numbers that describes the way in which the graphics chip – Antic – must display the screen. The address pointer to where the display list begins is at location 560-561 ($230-$231). The July to December 1985 issues of *Atari User* contained a comprehensive guide to the subject.

Cursor flashing

I WAS delighted to see my cursor flashing routine printed in the Five Liners section of the June issue of Atari User.

Unfortunately I have to admit there is a bug in the code as printed, which results in cassette users not having the protection against system resets as promised in the text. The program does work for disc users.

The fix is to replace the seventh number in the data on line 20 (a 14) by 10. Line 20 should now read:

```
20 DATA 104,165,9,41,1,240,
10,165,12,141,43,6,165,13,1
41,44,6,169,133
```

– B.M. Black, Preston, Lancs.

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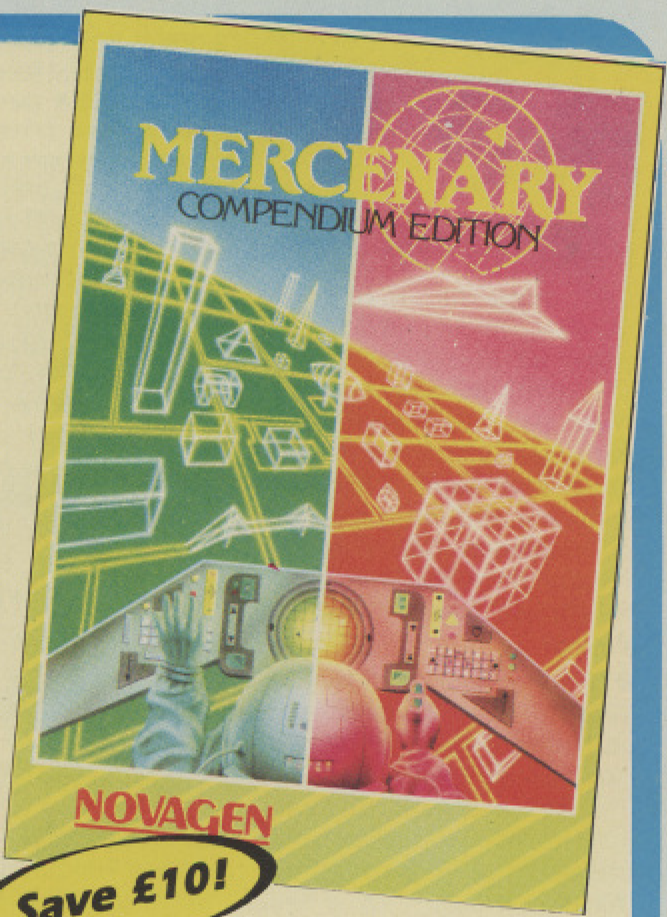
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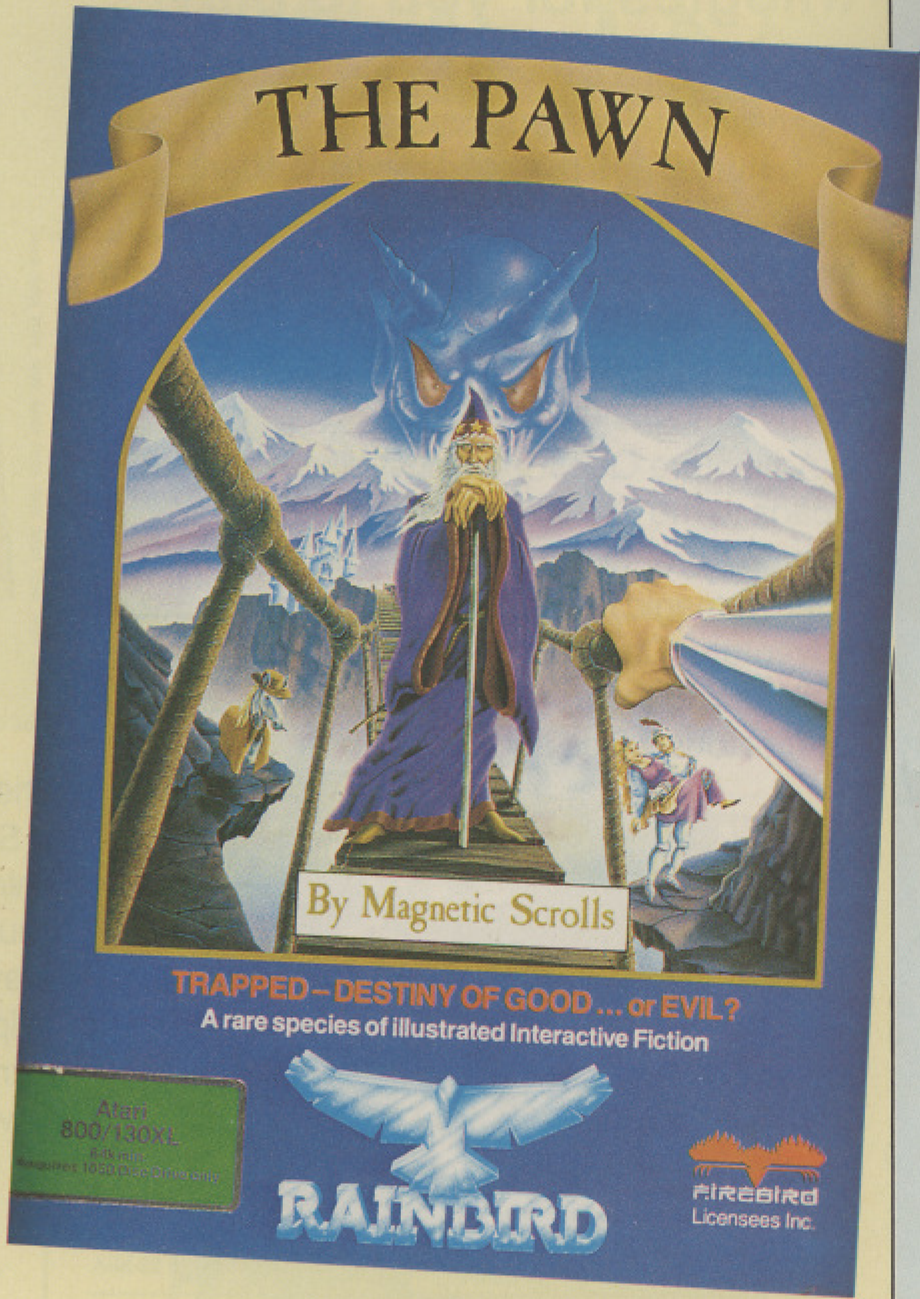


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– Anthony Ginn, writing about the Atari ST version in the May 1986 issue of the Atari User



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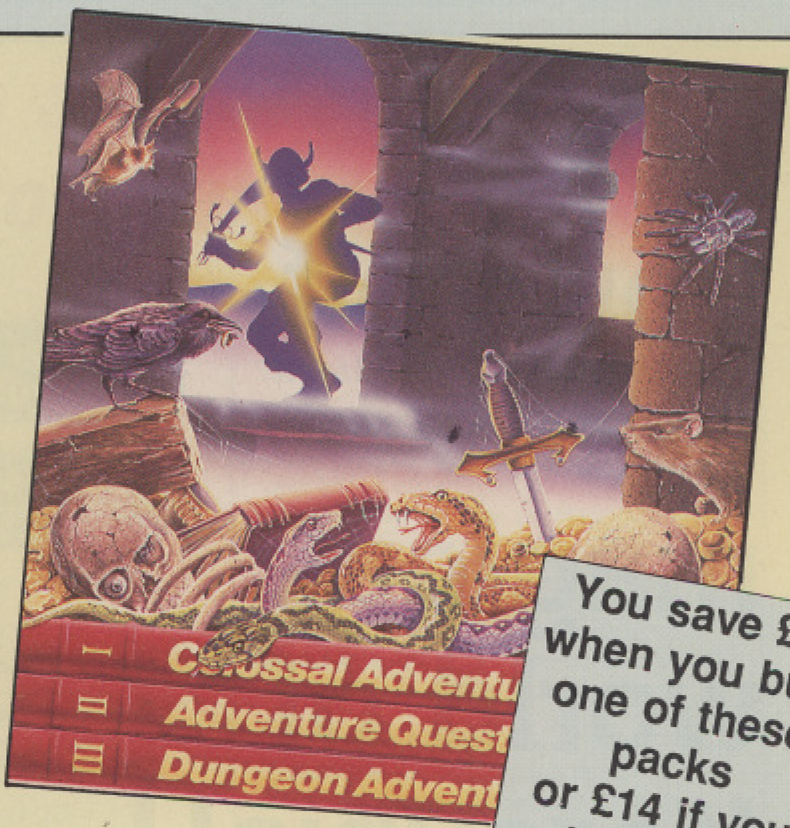
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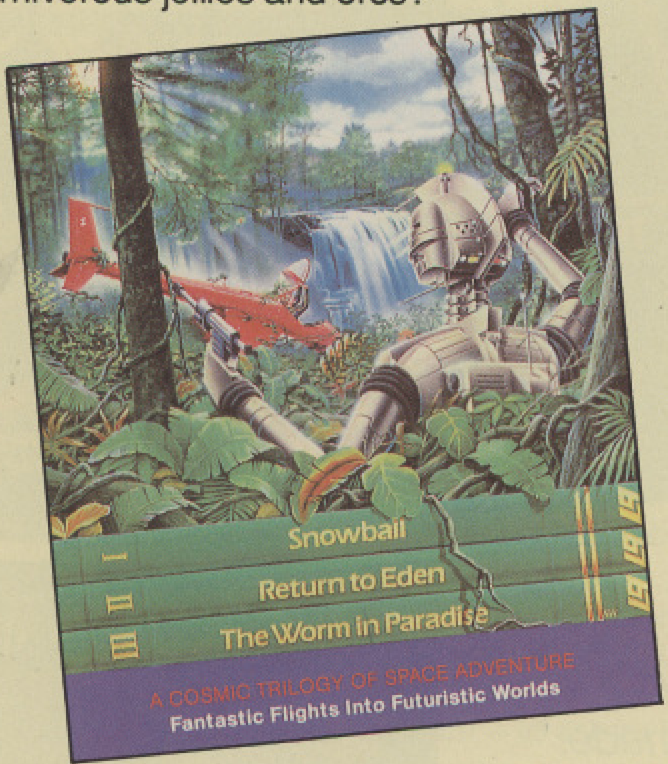
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You save £6 when you buy one of these packs or £14 if you buy both



The first adventure in the Silicon Dreams trilogy is Snowball. You awake from suspended animation to find your spaceship on a collision course with Eden. In Return to Eden you must prevent the defence robots from destroying your ship. You have lost your memory in the Worm of Paradise, and you may have to join the governing party to regain it.

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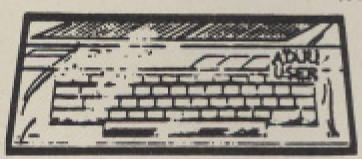
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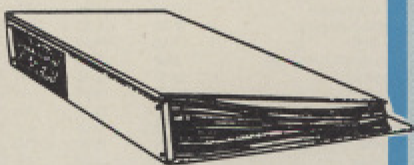


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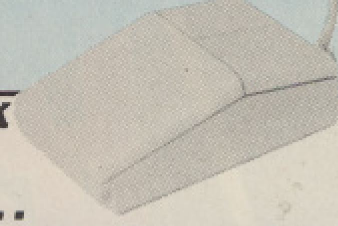
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